The Journal of the
American Medical Association

VOL. XXX. CHICAGO, ILLINOIS, APRIL 9, 1898. No. 15.

ADDRESS.

CHAIRMAN'S ADDRESS.

Delivered in the Section on Cutaneous Medicine and Surgery at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, Pa., June 1-4, 1897.

BY A. RAVOGLI, M.D.
CINCINNATI, OHIO.

It is extremely grateful to me on this happy and memorable occasion of the fiftieth anniversary of this great National ASSOCIATION, to have the honor of welcoming you to the City of Philadelphia as Chairman of this Section. This great city where the bell rang the first time for the freedom and the independence of the United States, has been the birthplace of the AMERICAN MEDICAL ASSOCIATION, one of the largest and most powerful medical organizations in existence.

To recall to you the beginning of this ASSOCIATION, its motives and its scope would be out of place, I will therefore limit myself to a few points of history concerning our special Section.

In 1869, at the annual meeting the assembly adopted a resolution which recognized specialties as a proper and legitimate field of practice. From that time several sections of medical branches were established, no one, however, showed the necessity of a section on the diseases of the skin.

If any work on dermatologic subjects was presented previous to the publishing of the JOURNAL, I was unable to obtain information as to its existence.

Dermatologic work appeared in 1883, when Dr. J. V. Shoemaker of Philadelphia, read an elaborate paper, "Mechanical Remedies in the Treatment of Skin Diseases," to the Section of Practice of Medicine and Materia Medica at the annual meeting in Cleveland. He considered all the different applications and surgical operations on the skin from the dermatologic standpoint.

In 1884, in the same Section of Practice of Medicine and Materia Medica in Philadelphia, Dr. Louis A. Dahring read a paper on "Dermatitis Herpetiformis." He, for the first time, published his ideas concerning a group of bullous eruptions, which were wandering without a name between eczema, herpes and pemphigus. It is not necessary for me to make any comment on this work, all dermatologists in every country have accepted his views, and dermatitis herpetiformis type, Duhring, is an established group of dermatoses.

For some years I could not find that any papers concerning dermatology were presented to this ASSOCIATION, until in 1887 Henry J. Reynolds read to the Section of Medicine, Materia Medica and Therapeutics a paper on "A New Method of Producing Local Anesthesia of the Skin." The paper was one of great interest concerning the anesthetic action of cocain by cataphoresis. He showed that with the application of a sponge saturated in a 5 per cent. solution connected with the positive pole local anesthesia of an area of the skin, where a dermatologic operation had to be performed, could be produced.

At the same meeting Dr. L. Duncan Bulkley of New York, read a paper, "Infant Feeding, Especially with Reference to Subjects with Infantile Eczema," to the Section on Diseases of Children. This paper has remained a model on this important subject. Bulkley moreover read another paper on "The Treatment of Felon Without Incision," in the Section of Medicine, Materia Medica and Therapeutics.

As you see, at that time the dermatologic work could find no place; it was scattered in the different Sections without recognition.

It was at the meeting in Central Music Hall in Chicago in 1887, through the zealous and indefatigable work of L. Duncan Bulkley, it was determined by the general assembly to increase the number of sections, and the Section of Dermatology and Syphilography was formed. This was the first time that dermatology and syphilography obtained recognition from the ASSOCIATION, and very justly L. Duncan Bulkley was elected Chairman, and T. F. Dunlap of Danville, Ky., Secretary.

In Cincinnati, May 8, 1888, this Section was called to order for the first time. Dr. Bulkley, Chairman, read an interesting paper on "Syphilis as a Non-veneral Disease."

I beg to refer to a few words pronounced at that time by the Chairman, expressing plainly and thoroughly the scope of our Section of the AMERICAN MEDICAL ASSOCIATION. "We gather here today at the first meeting of the Section on Dermatology and Syphilography of the AMERICAN MEDICAL ASSOCIATION, and in a measure to celebrate the recognition of this branch of medicine as a special department by the great representative medical organization of America. It is therefore an occasion in which those interested in this department of study and practice should feel a peculiar interest, and should particularly rejoice, for it certainly indicates an advance in medical thought and liberality, a broadening of the field of work of our ASSOCIATION, and it is to be hoped a benefit to the profession and community. The present Section is organized for work for the practical consideration of topics related to diseases of the skin, and it is hoped that it will contribute greatly to making dermatology a more interesting and successful field of labor, not only to those particularly engaged in this line of practice, but also to the general practitioner, to whom this branch often presents unusual difficulties."

I am unable to express in a better way the scope of the work of this Section, and these lines given by my predecessor will remain as an unchangeable law.

The first meeting was an assured success; papers of scientific and practical value were read by Zeissler and Reynold of Chicago; Ohmann-Dumesnil of St. Louis; Corlett of Cleveland; Fleischner of New

Haven; Palmer of Louisville; Juler and Ricketts of Cincinnati and many others. Several discussions were opened on important topics, as the "Etiology and treatment of eczema," by Bulkley, and the "Limit of the period during which syphilis can be communicated by contagion or inheritance," by L. B. Bangs of New York. It would take too long to give even the titles of the papers, which were read and review the discussions, but there is no doubt that this Section at the first meeting did good and profitable work.

In 1889 the meeting was held in Newport, R. I.; L. Duncan Bulkley remained the Chairman and W. T. Corlett was elected Secretary. The Chairman opened the meeting with an able address on "Recent Advances in the Treatment of Diseases of the Skin." Discussions were opened, one by Wm. T. Corlett and Henry Fleishner on the treatment of tinea tonsurans, another by L. Duncan Bulkley on "The Indications for and duration of the Treatment of Syphilis." Interesting papers were read by J. V. Shoemaker, Fred Levisseur, George T. Elliott, Ephraim Cutter, Abbott Cantrell and many others, closing the work with a paper by Bulkley, "The Early Recognition and Treatment of Epithelioma."

At the annual reunion in May, 1890, in Nashville, Tenn., Dr. Bulkley was again Chairman, and W. T. Corlett Secretary. The first read an address on "The Relative Value of Mercury and Iodin Compounds in the Treatment of Syphilis," and the second spoke on "The Effect of Boracic Acid on the Skin." Dr. M. B. Ricketts of Cincinnati reported two cases of atypic herpes zoster gangrenosa, and a few remarks on dermatitis herpetiformis were made by Ravogli. No report was given by the Secretary for this year and not even the program could be found.

In the same way no report of the Section was given for the 1891 annual meeting, held in Washington, D. C. Dr. Bulkley was still the Chairman. He read an address entitled "Clinical Notes on Lichen Planus." A complete report of the year 1892 shows excellent work done by this Section at the meeting in Detroit. Dr. Bulkley was again the Chairman and Ravogli was elected Secretary *pro tempore*. Over 100 physicians visited our Section. Papers of great importance were read, opening with the address of the Chairman on "Recent Advances in the Treatment of Diseases of the Skin"; more than twenty different dermatologic topics were presented and discussed by the members present. At this meeting Dr. Louis A. Duhring was elected Chairman and Dr. W. H. Dunlap Secretary.

The place of meeting for 1893 was Milwaukee. An interesting address was delivered by the Chairman, Dr. Duhring on "The Scope of Dermatology," and over twenty papers on dermatologic subjects were read and discussed.

At the meeting in San Francisco in 1894, Dr. Ohmann-Dumesnil of St. Louis, was Chairman of the Section, and Dr. L. F. Frank of Milwaukee, Secretary. In 1895 Dr. E. Regensburger of San Francisco, was Chairman, and Dr. D. H. Rand of Portland, Ore., Secretary. No report of the work of this Section can be found in the JOURNAL for these years, and not even the programs appear in the records.*

In 1896, at the meeting of Atlanta, Dr. L. Duncan Bulkley of New York, was Chairman, and Dr. T. C. Gilchrist of Baltimore, Secretary. An interesting and elaborate address was read by the Chairman on the "Newer Remedies used in Diseases of the Skin up to Date," referring to all new remedies and applications from his own practical experience. The program was one of the most important by reason of the selections of subjects and the work done by their authors.

It was at that meeting that I received from you the honor of being made Chairman of the Section.

Now at the celebration of the fiftieth anniversary of the ASSOCIATION, we have reason to congratulate ourselves for the work done by our Section since it was formed and recognized by the AMERICAN MEDICAL ASSOCIATION. The work which has been done is such as no other dermatologic society could do better. Our work is more of a practical character, and has the scope of placing dermatologic questions before the general practitioner and interest him in this medical branch. For many years dermatology has been for the generality of practicing physicians a *terra incognita*, and its study difficult or distasteful. But when we choose plain subjects adapted to the knowledge of the generality of practitioners, then we make this branch of medicine pleasant and interesting to all. Jonathan Hutchinson in his address, "The Future of Dermatology" at the meeting of the British Medical Association said, that "the aim of all true-hearted specialists was to break down the walls of specialism." This assertion has been happily repeated by Bulkley in his second address to this Section, saying that the Section on Dermatology and Syphilography is organized for work in the line of practical dermatology, and as a Section of the AMERICAN MEDICAL ASSOCIATION it should be attended by members who are not dermatologists, and subjects should be presented which are of practical interest and value to the general practitioner.

The study of dermatology is, in fact, so intimately connected with general pathology, that it is impossible to establish a rational treatment, without considering the skin lesion in reference to the physiologic and pathologic conditions of the general system. Dermatology has contributed much to the advances of general medicine. The study of the different morbid processes in the skin has increased the knowledge of the internal alterations, and has removed many erroneous ideas of the metastases. The morbid phenomena which occur in the skin are seen during life, and place the observer in a position to compare these, with what happens in the internal organs, which can be observed only after death.

If we consider, for instance, the group of herpes which have given origin to the myth of an herpetic diathesis, we find it clearly demonstrated to be in connection with the disturbances of the peripheral ganglia of the nerves. In the same way cases of nevi, leucodermiæ, atrophy of the skin and scleroderma, have been referred to conditions of peripheral neuritis. Many skin eruptions of the great family of the erythema originate from disorders of the vasomotor nerves. And again, that which produces this disorder of the vasomotor nerves has been found to be the toxins or toxalbumins resulting from an imperfect digestion, or from a stasis of the feces in the intestines, or from imperfect chemic changes in the metabolism of the tissues, acting as a poisoning agent on the center of the vasomotor nerves, causing erythematous eruptions. In the same way a large number of medicines are capable of producing eruptions of the skin which may be mistaken for almost any kind of dermatosis from a iodic acne to an arsenic cancer.

* NOTE.—None of the papers were ever received by the JOURNAL.—ED.

Often, in cases of gangrenous spots, or of localized erythema, we find the presence of sugar in the urine and today we know xanthoma diabeticorum as a manifestion of diabetes.

Since the discovery of the tubercle bacillus by Koch, it has been demonstrated that lupus vulgaris and other ulcers are only localized forms of the tubercular disease in the skin. It has also been shown that the tubercle bacillus can remain circumscribed in the tissue of the derma without producing infection. The infectious power, however, is not lost by the bacillus, which has for some years remained encapsuled in those tissues, and at any period we find that fresh lupus eruptions take place in old scars, healed long ago.

In lupus vulgaris multiplex, where many patches are present, we have some infection, and we find that potency of infection exists as we may have a rapid spreading of the lupus lesions in many regions of the body. The tubercle bacillus, however, remains in the tissues which it has affected, and for this reason the local treatment of lupus gives no anxiety as to the reproduction of tuberculosis in other organs.

Lupus erythematosus, which could not find a nosologic place, has been found to be a variety of tuberculosis of the skin, and has been associated with lupus vulgaris as a result of tuberculosis.

The action of tuberculin on the tubercular tissues could not be demonstrated in any other way than in the tubercular affections of the skin, and the first experiments with Koch's tuberculin were made on cases of lupus, showing the local reaction of the tissues invaded by the tubercle bacillus.

The combination of diseases has made clear many obscure points of pathology and the possibility of the existence of tubercular affections mixed with cancer is an assured fact, in lupus cancer.

Indeed, many simple granulomata of the face, or limited inflammatory processes, in time are changed to cancerous growths, due to cellular predisposition.

The knowledge of the parasites of the skin has greatly advanced general medicine, and, moreover, bacteriology has shown the local origin of the infection of so many diseases in the different organs composing the skin. The rôle played by the staphylococcus albus, aureus, etc., in the production of the different kinds of sycoses, in the furunculoses, in impetigo, the streptococcus in erysipelas, etc., show plainly the intimate relations existing between the general practitioner and the dermatologist.

The knowledge of syphilis, which takes so great a part in producing cutaneous lesions, is a portion of dermatology, which widely concerns the general medical practitioner. It refers to an immense field of important questions, which have to do, not only with the affected individual, but also with the happiness of his family. In many cases we can not find much in the history of the patient, and only by the condition of the skin and from other accompanying symptoms can we come to a conclusive diagnosis. In every stage of syphilis the skin is more or less involved, and it affords us the explanation of symptoms which could be mistaken for different affections. It is not necessary to remind you of the different affections of the various organs due to syphilis, which the general practitioner sees more often than the specialist. The advice often asked in reference to marriage, gestation, lactation, and the condition of the offspring, touch at first the general practitioner, and only afterward the specialist.

The therapeutics of diseases of the skin has shown clearly the necessity of connecting the skin lesions with the conditions of the general system in order to obtain decided results. With the exception of arsenic, which has a peculiar direct action on the eruptions of lichen and in some bullous eruptions, and of mercury for syphilis, we can not point out specific remedies in the therapeutics of the dermatoses. One of the most important points for the dermatologist is to institute a general treatment directed to correct the prevailing systemic disturbances, which are the cause of the trouble in the skin. We often see cases of nervous eczema which have been treated with external applications unsuccessfully, and only after a well directed internal treatment and a well adapted diet can it be brought to complete recovery. What I have said of this single instance can be applied to a large number of skin affections, which for a time have been regarded too much as purely local.

From the above considerations we see that dermatology can not be circumscribed within the limits of specialism, but it is one of the medical branches of much importance for the general physician and surgeon. THE AMERICAN MEDICAL ASSOCIATION having formed this Section has opened and widened the field of medical knowledge. It has placed within the reach of the general physician the study of dermatology, and has interested all practitioners in its study. In nearly all of the best medical colleges of this country dermatology and syphilography is now a special chair, and the students are compelled to pass examination in it. Clinical lectures on dermatology are delivered in many hospitals to the students, and the young physicians are now well acquainted with this medical branch. I am sure that the lack of knowledge of the diseases of the skin in this country, so lamented by Dr. A. R. Robinson in his address to the Section of Dermatology and Syphilography, at the International Medical Congress, in Washington, in 1887, has greatly diminished, and the AMERICAN MEDICAL ASSOCIATION has contributed its share by recognizing this branch among the Sections. I would now ask, through this great organization, that every regular college in the Union have the chair of dermatology and syphilography, with a final examination in these branches. This we will surely obtain when the physician realizes the imperative necessity of a knowledge of this branch.

From all I have said you can see that our Section has done good and important work. At the fiftieth anniversary of the ASSOCIATION, although scarcely ten years old, it shows a number of papers and discussions on interesting dermatologic subjects.

There is no doubt that the work of the American dermatologists has been recognized in the scientific world, and every year important treatises, interesting observations and scientific pamphlets are issued from this country, so that American dermatology is second to no other.

By placing this study within the reach of all practitioners, by compelling the students to pass examinations in dermatology, breaking this wall of specialism, we are sure that the future of dermatology will be much more brilliant and important. From the past we can judge of the future; if this Section in less than ten years has achieved so much, we can foresee that in the future it will be of greater honor to the members, of greater importance to the general physician, and of greater benefit to suffering humanity.

MODERN METHODS OF MEDICAL INSTRUCTION.

In response to a toast at a dinner of the Rush Medical College, March 17, 1898.

BY HENRY BAIRD FAVILL, M.D.
CHICAGO, ILL.

Mr. President and Gentlemen of the Faculty:

My interest in this matter is not greater than my marvel at the enormous advance which has occurred within the short space of years, since 1880, when my medical college experience commenced. And yet in drawing the comparison, which so forcibly presents itself, I must declare that it is not to the discredit of the early day, any more than that day was a rebuke to its predecessor. I believe that you will agree with me, that medical education offered to students at that day was as nearly abreast of the education possible for them, as is our present exhibition an approach to the present possibility. The great difference in spirit which strikes me as occurring in respect to medical education in general, lies in the attitude of the public toward the profession or more exactly of the State toward the medical school. In this the change is very pronounced and I believe the advancement is very clear. It is on the whole a matter for congratulation both to the schools and the profession at large, that society has seen fit to demand that we require of the medical graduates as good an education, as we offer. That this change has been instigated by the profession, is to its credit and does not qualify the advantage so far as society is concerned. That the means and methods to this end have been at times unreasonable, inconvenient, and are in many respects meddlesome, is but a passing annoyance as compared with the final advantage, which resides in the fact, that while the public is properly protected the medical schools are relieved of the embarrasment of illegitimate competition, and the entire process operates as a measure whereby there is culled the unfit material.

When we come to consider our own more specific interests as educators we would designate amongst many improvements three features in particular which claim our earnest consideration: First, the laboratory; second, the clinic; third, the recitation.

Of the laboratory too much can not be said, little need be said. It represents the utmost development of the educational idea. To have incorporated it in our own affairs to the extent possibly of disproportionate development credits us naturally with the desire to be entirely *en rapport* with the march of education in every department.

To one who has not had the advantage of a technical laboratory training, but whose interest and ambition have led him to the acquirement of lame and half satisfying methods in furtherance of his desire for power, the idea of laboratory training is most alluring. Recognizing this, it suggests to me qualifications upon which I wish to comment. The laboratory factor is liable to over-estimate in two directions: 1, by many of those who have had no laboratory experience, to whom the revelations of the laboratory assume an exaggerated importance, in consequence of the mystery which surrounds them; and on the other hand, 2, by those whose training assures their position as laboratory experts and whose occupation is of that fortunate stripe, rare in medicine, which results in the demonstration of things. These men for whom I have the most profound respect, naturally regard things from the laboratory standpoint, and being engrossed in it and trained to the primary idea of truth as dependent upon demonstration, are not quite prepared for the consideration of subjects which have as yet no laboratory point of view.

Many of these men have neither the inspiration for, nor the tolerance of the field of speculative medicine, within which, however, occur those projected lines, along which the correlation of knowledge for its practical application must occur.

These two reservations are of minor significance except as considered in the light of curriculum, and serve to emphasize merely the indisputable fact, that in producing a balanced result, medical reasoners, as complementary to medical investigators, are indispensable.

Our enconium upon the laboratory can not be diminished when we take up the subject of the clinic. Here there opens before us the hope of the future. Though the clinic has always existed, it is today in form and in spirit, quite different. The general clinic with the full amphitheater, though it remains in the form, is no longer the arena for the demonstration of the prowess, or for the personal aggrandizement of the professor. It is solely for the purpose of bringing the student in intimate contact with conditions which are to be in the future his perplexities, and as such is capable of being made most effective. The thing, however, which we earnestly crave is the clinic for small classes, the smaller the better.

The first advantage claimed for this, is that the student being permitted to examine the patients, and required to make a diagnosis, becomes immensely strengthened. This is in a measure true, though I believe those who are teaching clinically would agree with me that even this is subordinate in importance to the fact, that the interchange of thought between the students and instructors, in immediate presence of the subject, is usual, to a degree which in a large class is impossible.

I approach that which is to me at this moment of somewhat more immediate interest, the recitation.

In this innovation, we find the most signal departure from time honored method, and properly administered the most promising foundation for broad education. I repeat, properly administered, because I am positive that improperly administered it is a source of weakness. I stipulate, among many things, four which are primary to its propriety.

First, that the classes should be small, because we accomplish thereby, in this compactness, manageability, which includes the greater facility in determining the current acquisition of the students. And second, I would stipulate that the text employed be various. It is necessary for obvious reasons to have a uniform text, designated as a skeleton upon which to build, but I am emphatic in my declaration, that students should be encouraged to seek the information preparatory to the recitation, from all available sources, and that this exercise should be the meeting ground upon which should be thrown all possible side lights, and upon which should be harmonized, as far as possible, whatever apparent conflict may arise. Thus we lay the foundation for breadth of view.

I approach the third requirement with hesitancy, yet I trust even by my colleagues who are touched by this, that I shall not be misunderstood. I believe that the instructors should be men of experience, more or less according to the subject involved, but

with the firm conviction that the more experienced the better. I am sure that no man is so capable of illuminating the obscure path, as one who has been lost in it.

The combination of intelligence and sympathy which results from such experience is invaluable to the teacher. To have these conditions satisfied ideally, particularly at the outset of the new regime, is impossible. To build toward them is imperative.

To this end I suggest, that every effort be made to retain in the service of the institution, the men who justify their relation to it, and at every hand to so dignify their relation, that the feeling of responsibility shall reinforce the interest which may flag under neglect.

Fourth, and most important, comes the question as to the relation of the instructor to his class. Shall he be a critic whose function begins and ends with an inquisition as to the presence and industry of his students as evidenced by their ability to recite, which function I would not underrate, or shall he be in addition, an expounder of the subject?

That the latter should be admits of no question.

In the first place because medical literature is unfortunately obscure and needs intelligent presentation. In the second place medical information is shifting and needs a current commentator for the correction of the misconceptions of the past. These facts being beyond dispute, the question simply remains, shall this important work be done by the instructors or by the professor at large, if I may use the term?

Assuming the competency of the instructor, I unhesitatingly select him for the function for two reasons: First, because with the assumed limited class one secures the psychologic advantage of man to man contact. Second, because the essence of instructive analysis is interrogation, which implies a slowness of procedure, and a quality of relationship, which is possible only in the class room.

It might be queried in the light of all this disposition of labor into the departments of subordinate instructors, what becomes of the chief faculty. Are they, in the new adjustment, mere figure-heads? I confess that in the extravagance of expression which one sometimes hears in discussion of the new regime, it might so appear. To me the assumption of higher achievement through the working out of the processes just discussed, implies a field of usefulness for the heads of the departments enormously elevated and dignified. It is true that much of the detail of their labor is cut off. It is true that much of the prominence of a certain kind is removed, but I call your attention to these facts.

In medicine as in no other field of research, there is at present no such thing as fixed authority. The dictum of no man is better than another's, except in so far as the depth of his research or breadth of his experience and the integrity of his reasoning process, justifies it. The profession has not to deal with an accumulated mass of settled fact. It has to deal with an enormous reservoir of knowledge, into which flow streams of more or less disconnected observation. But for every drop of fixed knowledge, there is a flood of interpretation, and upon the selection of the instrument of interpretation will rest the value of the store which the student may acquire.

Is the student about to be graduated capable of being his own interpreter? Is he sufficiently in possession of the facts, and has he the perspective to enable him to wisely select the theory and adopt the practice under such conditions? Assuredly, most assuredly not. Here then lies the highest prerogative of the department head.

To him let it fall to summarize knowledge, to analyze experience, to harmonize conflict. And in so far as he is fortunately possessed of personality, to so impress himself and his wisdom upon the students that he utter for their provisional guidance a working hypothesis, as indispensable here as elsewhere, which shall bear the stamp of the organic body, which launches its graduates.

ORIGINAL ARTICLES.

A CASE OF MENINGOMYELITIS, RESEMBLING IN SOME RESPECTS LANDRY'S PARALYSIS, WITH SPECIAL REFERENCE TO TUBERCULOUS MENINGOMYELITIS.

FROM THE WILLIAM PEPPER CLINICAL LABORATORY, UNIVERSITY OF PENNSYLVANIA.

Presented to the Section on Neurology and Medical Jurisprudence at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY WILLIAM G. SPILLER, M.D.

PROFESSOR OF DISEASES OF THE NERVOUS SYSTEM IN THE PHILADELPHIA POLYCLINIC; ASSOCIATE IN THE WILLIAM PEPPER CLINICAL LABORATORY.

PHILADELPHIA, PA.

The case which is reported in this paper was studied clinically by Dr. James Hendrie Lloyd, during one of his terms of service at the Philadelphia Hospital, and the clinical notes were taken by him.

J. H. A. was 40 years of age at the time of admission to the Philadelphia Hospital, June 27, 1894. He gave no history of hereditary disease, and stated that previous to his present illness he had always been in good health, with the exception of a constant sick headache, which he had had since the age of 3 years. This was sometimes accompanied by vomiting. No treatment gave him relief. During the year previous the headache had been growing less severe, and during the two months before his entrance into the hospital it had ceased entirely. He denied having used alcohol, or having had venereal disease. In earlier life he had been a school teacher, later a grocer.

Eight weeks before his admission, a drunken man had entered his house and smashed a lamp. He had become greatly excited by this, and had had a severe nervous shock, as he expressed it. Inquiry elicited from his brother the information that the patient had had domestic trouble, and that this person said to be a drunken man was in reality the patient's intoxicated wife. There was evidently at this time a mental disturbance, due possibly, as indicated by the microscopic findings, to cerebral meningitis or bacterial poisoning. A few days later he says he had an attack of stomach trouble, and yet he could give no history of the symptoms of gastric disease. He had had no pain, had not vomited, and had been able to eat anything with impunity. Dr. Lloyd obtained from his friends the statement that his condition resembled that of typhoid fever. He was sick in bed for one month and recovered at the end of that time, but did not work. Two weeks later he had an attack of nervousness, as he expressed it, in which he trembled very much. During the two weeks previous to admis-

sion to the hospital, his arms became weak and he was unable to dress or feed himself. At nearly the same time weakness of the legs was noticed. He had absolutely no pain. When he sat down he could not rise without assistance. His bowels were regular and his appetite good. The report of the examination made by Dr. Lloyd at the time of admission, June 27, 1894, is as follows: The patient was found to have inability to pass his urine and it was necessary to catheterize him; later he developed incontinence.

He was a thin, anemic man, apparently not 40 years old. His speech was rather slow and not well articulated, and had been of this character for ten days, according to his statement. His eyes were injected. Spasms of the orbicularis palpebrarum were frequent. There was no nystagmus. His pupils were equal and responded to light and in accommodation. The visual fields were normal. Hearing was not impaired. His tongue was protruded in a straight line, was heavily coated, and presented some fibrillary twitchings. His chest was poorly developed, though the respiratory expansion was normal. The apex of the right lung presented dulness posteriorly, increased tactile fremitus and crackling râles. The left apex posteriorly also gave some dulness. The pulse was rapid and weak, and the arteries were very much thickened. The apex beat of the heart was in the fifth interspace outside the nipple line, and easily seen. A murmur, not transmitted, presystolic in time, was detected at the apex. The abdomen was scaphoid in shape. The liver and spleen were of normal size. Voluntary flexion and extension of the left upper limb at the elbow were impossible, and much impaired at the wrist. Pronation and supination of the left forearm were imperfect. Voluntary flexion was possible at the right elbow, but the power of extension was lost, otherwise the conditions were the same as in the left arm. The pectoral, supra- and infra-spinous muscles were intact. The dynamometer registered 20 in both hands. All the voluntary movements of the lower extremities were imperfect. There were no areas of anesthesia. The knee jerks were exaggerated, but sluggish; the muscle jerks were also exaggerated; ankle clonus was obtained but soon exhausted, wrist clonus was also observed. On mensuration the following figures were noted:

	June 27.	July 8.
Right upper limb at shoulder	13 inches	13 inches
Right upper limb at axillary fold	7½ "	7½ "
Right upper limb at mid portion of arm	7½ "	7½ "
Right forearm	8 "	8 "
Right lower limb at thigh	13½ "	11¾ "
Right lower limb at calf	10¼ "	7¾ "
Left upper limb at shoulder	13 "	13 "
Left upper limb at axillary fold	7¼ "	7¼ "
Left upper limb at mid portion of arm	7¼ "	7¼ "
Left forearm	8 "	8 "
Left lower limb at thigh	13½ "	11¾ "
Left lower limb at calf	10¼ "	7¾ "

The electric reactions to the faradic current were normal, to the galvanic they were as follows:

Forearm flexors Forearm extensors Forearm pronators	ccc> acc
Biceps	ccc <acc
Pectoral	ccc> acc
Lower limbs peroneal Anterior tibial Gastrocnemius	ccc <acc
Flexors of legs	ccc=acc
Muscles of thighs	ccc <acc

Considerable atrophy was thus observed in the lower limbs, which developed within two weeks, and reaction of degeneration, *i. e.*, change in the formulæ, was noticed in some of the muscles of both upper and lower limbs.

During the early part of July the patient appeared to be improving and regained considerably the power of moving the upper extremities, but during the latter five or six days of the month his disease took a decided turn for the worse. The temperature rose to between 101 and 102, and the hurried, labored respiration gave evidence of a marked pulmonary affection. Satisfactory physical examination at this time was impossible on account of the low condition of the patient. Death occurred Aug. 1, 1894.

The autopsy was made Aug. 2, 1894, by Dr. W. S. Carter, the condensed report of which is as follows:

The body was much emaciated. The entire vascular system had undergone a premature senile change, which in a man of forty years was remarkable. The aorta and other vessels, including the circle of Willis, were markedly atheromatous. The heart was hypertrophied. The leaflets of the mitral and aortic valves were thickened. The orifice of the mitral valve measured ninety-five mm., that of the aorta sixty-eight mm. The kidneys were small, tough and granular, presenting the appearance of interstitial nephritis. Decided catarrhal pneumonia was noticed at the base of the left lung. There were evidences of tuberculosis in various parts of the body. Tubercles were found in the lungs, spleen and liver. The bronchial, retro-peritoneal and mesenteric glands were enlarged and yellowish. There were some evidences of tuberculous meningitis. Apart from some congestion and perhaps slight adhesion of the pia, together with the atheromatous condition of the vessels previously mentioned, no macroscopic anomaly was detected.

The microscopic report by the writer is as follows:

In the lumbar region a round-cell infiltration, very similar to that seen in syphilis, is found within the meninges and spinal roots, and is somewhat more extensive here than at any other portion of the cerebrospinal axis. The round cells are more numerous in certain parts of the pia; they are also found about some of the vessels of the cord, and indeed here and there where no vessel may be observed. The vessels of the meninges and spinal cord are distended. Within the white matter, more especially in the anterolateral columns, numerous small spaces are found which possibly are the result of destruction of nerve fibers. Certain histologists have regarded these spaces as artefacts, others have been unable to accept this view. They have been noted especially in cases of pernicious anemia and in paralysis agitans. Axis cylinders may be found in many of these spaces, and in some they are surrounded by a medullary sheath, though in general the medullary sheath is swollen and transparent. Homén[1] has also described these spaces in the dog's cord in secondary degeneration.

Many of the motor cells of the anterior horns, especially in the lumbar region, are tumefied, rounded off, without protoplasmic processes and contain vacuoles. Some present a more normal appearance. In some the nucleus has taken a peripheral position. Marinesco[2] regards this displacement of the nucleus as very important. As a rule, the nucleus occupies the

[1] Homén: Atlas der pathologischen Histologie des Nervensystems Part VI.

exact center of a nerve cell, for it is at this part that nutrition of the cell is greatest. The migration of the nucleus, according to his view, is an attempt on its part to reach a portion of the cell where nutrition is better.

The vacuolization of nerve cells has given rise to endless discussion. Hitzig[3] has recently stated that he regards it as a manifestation of disease; others, and among them Nissl,[4] look upon this as a postmortem change. But it has been stated that even if the latter view is correct, it is probable that this alteration takes place during the process of hardening of tissue in the chromic salts, more commonly in diseased cells than in normal (Leyden and Goldscheider).[5] This view seems acceptable, for in spinal cords in which there has been no reason to suspect organic changes one does not find such vacuolization as seen in this case. The method of Nissl could not be employed, as Müller's fluid had been used as the hardening agent. Nissl[4] expresses the opinion that nerve cells may be restored as long as the nucleus has not been greatly altered. The cells in this case had apparently not reached this critical stage.

I have been surprised to find so many amyloid bodies, especially within the lumbar region. It is well known that these occur normally in the central nervous system, but usually in more limited numbers, except perhaps in the olfactory lobes. When stained with any of the ordinary solutions of alum-hematoxylin they are of a light purple color, homogeneous in appearance, of various sizes, round and considerably larger than the nuclei of the neuroglia cells. These bodies, as in this case, are especially numerous in the posterior columns, within the septa, near the vessels, about the central canal, and especially within the zones of Lissauer. They extend a short distance into the posterior roots and cease here abruptly. Redlich has studied these formations and states that they give the amyloid reaction with Lugol's solution and sulphuric acid. This is an observation which the writer has been able to confirm. Redlich does not regard them as of the same nature as the amyloid bodies of the prostate gland, or as ordinary amyloid infiltration, and the writer also has not been able to obtain the characteristic reaction with certain stains usually employed for amyloid substance. Redlich regards these bodies as derivatives of altered neuroglia cells; other histologists look upon them as formed from the axis cylinders. Homén[1] states that they come from degenerated fibers. They indicate a chronic, retrograde process. I have found them in large quantities in cases of tabes, syringomyelia, syphilis, senility, etc. It was with some surprise, however, that so many were observed in this case, for the history indicated rather an acute process, and the man was at that period of life in which they do not usually occur in such numbers. The patient had sclerosis of the vessels, but in the lumbar region the small arteries and veins present no notable thickening of their walls as is seen in the cervical region and at the base of the brain, and it is especially in the lumbar region that the amyloid bodies are so numerous. It does not seem reasonable to suppose that the arterio-sclerosis accounts entirely for their formation, but we may regard them as representing some form of degeneration not entirely acute, and possibly in connection with the tuberculous process.

In the thoracic region the findings are similar to those of the lumbar; in one portion near the periphery of the cord, peculiar, irregularly formed bodies, stained red with the carmin, are observed. They do not resemble cells, and may possibly be swollen fragments of axis cylinders or swollen neurogliar cells. Here and there in the gray matter of the thoracic region small hemorrhages are noticed. Some few of the vessels within the cord have thickened walls which have undergone hyaline degeneration. By the method of Weigert, apart from the many red blood corpuscles observed within the meninges, and the thickening of the vessels in the upper regions of the cord and at the base of the brain, nothing pathologic would be suspected.

In the cervical region in some of the small meningeal arteries, the intima is much thickened and the media and adventitia are infiltrated with round cells, but there does not appear to be a reduplication of the elastic membrane. The walls of the small meningeal veins are also thickened, and in some the lumen is much reduced. Throughout the meninges and not confined to the cervical region, there is an abundance of blood pigment and red blood corpuscles. The round cells are found scattered singly through the tissues or collected in groups, but the infiltration is only of moderate degree. In one section, for example, a collection of cells mingled with red blood corpuscles may be noticed about one of the anterior roots. Such a condition when existing in the lumbar region may explain, in part, the symptoms of weakness and the increased though sluggish reflexes. The vessels within the spinal roots are much distended, cellular infiltration is noticed in these parts and, to a moderate degree within the septa, sometimes spoken of as pial, though the connection of these septa with the pia has been disputed (Lenhossék,[6] Edinger[7]). Small collections of blood pigment are found within the cord. The number of the capillaries of the anterior horns appears greater than normal. Hemorrhage is also found within the gray matter. The method of Marchi reveals much pigment within the ganglion cells, but nothing which could be considered distinctly pathologic. This method is valuable for a study of the development of pigment, as the fatty nature of this substance causes it to be colored black by the osmic acid.

At the base of the brain, to which attention has been directed on account of the history of spasm of the obicularis palpebrarum, a moderate degree of round-cell infiltration has been found which may possibly have irritated some of the fibers of the seventh nerves. Similar accumulations of blood pigment and corpuscles are found at this level.

In those portions of the cerebrospinal axis which have been kept two years in Müller's fluid peculiar bodies have been noted. They are not to be observed to any notable degree in any portion of the cord which has been preserved in alcohol. They are small, round or oval, stain deeply with Delafield's hematoxylin and with thionin, even more deeply than do the nuclei of the round cells. They are intensely stained at the periphery, while the center is only faintly colored. These bodies are found within the cord, within

[3] Marinesco: Revue Neurologique, No. 21, 1896.
[4] Hitzig: Neurologisches Centralblatt, No. 20, 1896, p. 950.
[5] Nissl: Idem.
[6] Leyden and Goldscheider: Die Erkrankungen des Rückenmarkes und der Medulla Oblongata, p. 75.

[6] Lenhossék: Der feinere Bau des Nervensystems, p. 237.
[7] Edinger: Vorlesungen über den Bau der nervosen Centralorgane, fifth edition.

the neurogliar trabeculæ, along the small vessels, and within the pia, especially at its junction with the spinal cord, where they are arranged in long rows, although they are also found in groups. The fact that they are only to be seen, to any notable degree, in tissues preserved in Müller's fluid proves that they could not have been in causal relation with the morbid process. It has been my experience that Müller's fluid does not arrest the development of all low forms of life. Prof. A. C. Abbott, of the University of Pennsylvania, has given his opinion in regard to these bodies as follows:

"1. They are not spores, because they stain readily. Spores are also highly refractive.

"2. Unless they came from extraneous sources spores would not be likely to occur within the tissues.

"3. They are of oval shape. The irregularity in their size, the peculiarity of their staining, and more especially the appearance of budding that is frequently noticed, would seem to support the opinion that the bodies found here belong to the group of blastomycetes (yeasts).

"4. The peculiarity of staining consists in the accentuation of the enveloping membrane over the body of the cell.

"5. They can not be micrococci."

I have frequently found similar bodies in other material hardened in Müller's fluid.

Sections examined from the brachial plexus, the peroneal and sciatic nerves, show no notable degeneration of nerve fibers. Round-cell infiltration of very moderate degree is observed within some of the nerve bundles and their sheaths.

In view of the importance of determining the presence or absence of micro-organisms in this case, I requested Drs. Kneass and Taylor of the Pepper Laboratory to make an examination with this object in view. They have been unable to find any organic forms not already mentioned. A number of sections have been stained by the writer, in the hope of finding the tubercle bacillus, or some other form of micro-organism, but success has not crowned his efforts. Recently most interesting experiments have demonstrated that the injection of bacterial toxins into the lower animals may produce neuritis and meningomyelitis. Such experiments have been made by Claude,[8] Homén and Laitinen,[9] Marinesco,[10] and Remlinger.[11] Work bearing on this subject has been done in our country by Welch and Flexner.[12]

We may say in regard to the microscopic examination of this case that the condition is one of meningomyelitis, involving also the membranes at the base of the brain, with very imperfect evidences of neuritis. No cutaneous nerves were obtained for examination. Arterio-sclerosis, of not recent origin, is found in the vessels at the base of the brain, and in the smaller vessels of the upper part of the cord. The meninges covering the spinal cord and at the base of the brain are infiltrated by round cells and contain much blood pigment and many blood corpuscles. The motor cells of the anterior vacuoles and horns are swollen and rounded off, and many contain displaced nuclei; many however show no alteration. Round-cell infiltration and capillary hemorrhages are found here and there in the spinal cord. The lesions are rather more intense in the lumbar portion; in this part also, where the arterio-sclerosis is not marked, there is great excess of amyloid bodies. No tubercles, no giant cells and no low organic forms, except the blastomycetes, are found anywhere. What is the cause of this process? The writer is inclined to attribute it to tuberculosis.

With such a clinical history as the one given in this paper, it is not surprising that the diagnosis of Landry's paralysis was uppermost in Dr. Lloyd's mind, although there were certain atypical features in the case. It was undoubtedly a morbid process affecting the motor portion of the nervous system, and producing no symptoms from involvement of the sensory side. It could hardly be a neuritis as the word is usually understood, unless we mean that the cells of the anterior horns of the cord were chiefly diseased, and the peripheral part of the neurons only secondarily affected. Motor neuritis without involvement of sensory fibers does occur, as may be seen from the case of Dejerine and Sottas,[13] specimens from which have been given the writer. One would think twice, however, before making the diagnosis of pure, primary motor neuritis. It seems probable that the Charcot-Marie type of muscular atrophy is often a motor neuritis, and yet this is not acute or subacute, as was the process in the present case. This patient had no disturbance of sensation, no sensitive points along the line of the nerve trunks, and the exaggerated though sluggish knee jerks were not in favor of neuritis. Could the case have been a subacute form of anterior poliomyelitis? There was much in favor of such a view. The motor paralysis, the reaction of degeneration, the absence of sensory symptoms, even the vesical paralysis, could all be easily explained by such a theory. But exaggerated reflexes do not belong to this disease, and there was evidently some process here which both irritated and weakened the peripheral motor neurons. If we turn to the paper of Diller and Meyer[14] we find given as the cardinal points of Landry's paralysis: "1, flaccid paralysis of the muscles, spreading rapidly from one point over the rest of the body, generally beginning in the legs, but sometimes following the reverse order, as in the French zoölogist Cuvier; 2, absence of muscular atrophy and of electric reaction of degeneration; 3, tendon and superficial reflexes absent; 4, sensibility not, or only slightly impaired; 5, sphincters, as a rule, intact (exceptions rather frequent); 6, a criterion has been the absence of an anatomic lesion."

We will see that the very first requirement can not be met. The paralysis probably was not flaccid. The duration of the process from the time paralysis was first noticed until death occurred was about six or seven weeks. The upper extremities were first paralyzed, but very soon the lower were also affected. The patient was thin and anemic, and yet muscular wasting developed very rapidly in the lower limbs. There was reaction of degeneration *i. e.*, inversion of the formulæ, in all the muscles of the lower limbs, and in the biceps of the upper. The tendon reflexes not only were not absent, but were exaggerated and sluggish. As a case of Landry's paralysis the symptoms were atypical.

The findings permit a pathologic diagnosis of men-

[8] Claude: Comptes Rendus Hebdomadaires des Séances de la Soc. de Biologie. 1896.
[9] Homén and Laitinen: Idem.
[10] Marinesco: Idem.
[11] Remlinger: Idem.
[12] Welch and Flexner: The Johns Hopkins Hospital Bulletin. ii, 107, 1891; iii, 17, 1892. The Johns Hopkins Hospital Reports, vi, 1896.
[13] Dejerine and Sottas: Comptes Rendus Hebdomadaires des Séances de la Soc. de Biologie. 1896.
[14] Diller and Meyer: The American Journal of the Medical Sciences April, 1896.

ingomyelitis of moderate intensity. Is it possible to reconcile the symptoms observed during life with such a process? How shall we explain the absence of sensory symptoms? The clinical picture was not that of meningitis. In this disease, however, one must be prepared for the unexpected. The meningitis was only of moderate intensity in the case under consideration, and it is probable that the irritation was not sufficient to produce sensory symptoms. It may be that the central nervous system was overpowered by some toxin brought through the circulation, and that the symptoms were due more to myelitis than to meningitis. That certain poisons act on nerve cells and nerve fibers in such a way that they produce functional changes before organic alteration can be detected, even by the best technique, is a view which is probably correct. Wagner[15] has called attention to gastro-intestinal disturbances as a cause of polyneuritis and psychoses, probably produced by the action of some poison absorbed from the gastro-intestinal tract. Neuritis after infectious diseases is probably chiefly due to the toxins produced by the bacteria. Still earlier, Dercum[16] has spoken of the influence of auto-intoxication in psychoses, and more recently Allen McLane Hamilton[17] and Van Gieson[18] have written papers on this subject. It is doubtful whether we should find lesions in all such cases. But there was something more than functional disturbance in this case, for many of the motor cells of the anterior horns, especially in the lumbar region were much altered. The atrophy and reaction of degeneration were most evident in the lower limbs. A meningitis of moderate degree not infrequently fails to produce symptoms. The typhoid condition and the mental state preceding (Cavasse[19]) may have been due to such alterations as have been detected throughout the body. This patient had general tuberculosis; this alone would account for the resemblance of certain of his symptoms to typhoid fever.

Anyone who examines the literature will find a number of atypic cases of myelomeningitis, especially of the tuberculous variety. We may refer in this connection to Schultze, Goldscheider, etc.; Schultze[20] says that every symptom of meningitis and myelitis, even in histologically demonstrable cases of these affections, may be absent and the clinical picture may be one of acute ascending paralysis. It must be remembered also that meningitis in the adult may present a more atypic picture than in the child (Cavasse l. c). Chantemesse (quoted by Cavasse) has written a thesis on the atypic form of tuberculous meningitis. Oppenheim[21] tells us that an extensive purulent cerebro-spinal meningitis may be without symptoms, and he speaks of the polymorphism of acute meningitis. The spasms of the orbicularis palpebrarum, the exaggerated but sluggish knee jerks, the fibrillary tremor of the tongue, are explained by the findings. There was no reason for suspicion of syphilis from the history and condition of the patient. Can we find any ground for believing that this case may be considered as possibly one of tuberculous meningomyelitis?

The involvement of the spinal cord in the tuberculous process has been known for many years. Among the early writers on this subject mention may be made especially of Liouville.[22] Erb,[23] in 1876, remarked that tuberculous spinal meningitis is not uncommon in connection with the basal form. Schultze[24] also has regarded the tuberculous spinal meningitis as by no means rare, and the association of it with the basal form as the rule in the adult. This view is held also by recent writers (Oppenheim,[25] Goldscheider,[26] etc.). Miliary tubercles were not found in the cord in all of Schultze's cases. His statements made in 1880 are to the effect that miliary tubercles are much less frequent in the spinal membranes than in the vessels and membranes of the brain; according to him, the posterior portion of the cord is the part most affected, although when the process is severe the anterior part of the cord may also be involved. The cord proper takes part in the morbid process, and the findings consist of edema, swelling of the axis cylinders, moderate tumefaction of the ganglion cells, more homogeneous appearance of the neuroglia, with more intense coloration under the action of stains, and cellular infiltration of the peripheral portions of the cord, chiefly noticeable in the lateral and posterior columns and in the thoracic and lower cervical regions. Cellular infiltration is common in the septa, and the cells may collect so as to form small tubercles. Small hemorrhages are frequently found. The roots present similar lesions.

Williams,[27] also, at an early date reported cases of cerebrospinal tuberculosis in which he found round-cell infiltration of the arachnoid, pia and cord. In two of his three cases it is stated that distinct miliary tubercles were not observed in the cord, although in one of these two cases they were found in the brain.

Goldscheider[28] has published a most interesting case. Violent contractions were observed in the muscles of the arm and forearm, shoulder and breast, while movements of the hands and fingers were free. There was lack of power and the reflexes were increased in the upper limbs. Sensation was normal. The patellar reflex was exaggerated. The only pain felt was that due to the violent contractions. At the autopsy in this case extensive pulmonary tuberculosis was observed. In the fresh state nothing was seen in the cord, oblongata or brain, but after the hardening the pia on the anterior part of the cord, from the fourth cervical to the first thoracic segment, was found to be moderately thickened and infiltrated with round cells. The anterior columns and periphery of the cord were also invaded by the round cells. The condition is described as anterior myelomeningitis. Similar cells were found within the anterior roots. Nothing abnormal was observed outside of the area mentioned, except a diffuse descending degeneration of moderate degree in the anterior columns. There was no tuberculous basal meningitis and no vertebral caries. No microorganisms of any kind could be detected and there were no signs of syphilis. This irritation of the anterior roots was supposed to have caused the contractions and exaggerated reflexes. The cervical meningomyelitis was thought to be tuberculous.

The tuberculous leptomyelitis, according to Raymond,[29] is not as rare as one might think. The diffuse

15 Wagner: Wiener klin. Wochenschrift, 1896.
16 Dercum: The Medical News, July, 1895.
17 Hamilton: The New York Med. Journal, October and November, 1896.
18 Van Gieson: State Hospital Bulletin, vol. i, 1896.
19 Cavasse: Revue de la Tuberculose, No. 3, 1896, p. 222.
20 Schultze: Abstract in Neurologisches Centralblatt, 1887, p. 238.
21 Oppenheim: Berliner klin. Wochenschrift, Nov. 9, 1896.
22 Liouville: Archives de Physiologie, 1870.
23 Erb: Ziemssen's Handbuch der speciellen Pathologie und Therapie, Bd. xi, 1876-78, 1, p. 229.
24 Schultze: Deutscher Archiv für klinische Medecin, 1880, 25, p. 297.
25 Oppenheim: Berliner klinische Wochenschrift, 1891, p. 1000.
26 Goldscheider: Idem.
27 Williams: Deutsches Archiv für klin. Medecin, 1880, p. 292.
28 Goldscheider: Berliner klin. Wochenschrift, 1891, p. 985.
29 Raymond: Revue Neurologique, 1895, p. 98, and Revue de Méd., 1886.

infiltration is much more common than are the large spinal tubercles, and it has not attracted the full attention it merits, as it easily escapes detection. Few writers, indeed, have spoken of this infiltrating form. In very many cases where tuberculous patients have died from acute generalization of the process, or even, perhaps, from slower development, an infiltrating leptomyelitis may be found. Even though with the naked eye the cord in certain cases appears sound, the microscope often reveals tuberculous lesions. The tuberculous leptomyelitis may exist with similar lesions in the brain, but it may be alone. It is quite probable that the nervous symptoms which occur in the course of tuberculosis may be attributed to this complication, at least in a certain number of cases. He has in mind the neuralgia, myalgia and hyperesthesia, which form part of the ordinary symptoms of chronic or acute phthisis. The lumbar region is the portion usually most involved in the tuberculous process. Raymond divided tuberculous meningitis into the chronic and acute forms, and the latter still further into the infiltrating (or diffuse) and the nodular varieties.

In the diffuse form the miliary tubercles are rare, and in some cases it is only by chance that such a tubercle is found in a section. It is difficult to distinguish the infiltrating tuberculous myelitis from the early stages of the simple acute form, if some miliary tubercles are not observed. He described a case of Pott's disease in which, in addition to chronic meningomyelitis, the appearance of more acute changes with hematomyelia were noted. The dura, arachnoid, pia and spinal roots were infiltrated with leucocytes, in some places large groups of round cells were noticed. At no part of the cord proper or pia were specific tuberculous lesions observed. The arachnoid was thickened and infiltrated, and at the portion corresponding to the caries of the vertebræ contained tubercles with giant cells. Specific lesions were also found in the dura. Expressed in a few words, it may be said that this patient had slight diffuse chronic leptomyelitis, associated with an acute form of the process, and that this was known to be tuberculous from other findings. In the dura and arachnoid specific lesions were present.

In the report of a case of meningomyelitis by Raymond in the *Revue de Médecine*, 1886 (Case No. 2), the statement is made that no miliary tubercles were found with the naked eye or with the microscope. Congestion of the vessels and diffuse round-cell infiltration, slight thickening of the meninges, some swollen axis cylinders, obliteration of the central canal, tumefaction of the ganglion cells were observed. He says: "It is a diffuse general leptomeningitis of a diffuse and infiltrating form, evidently of tuberculous origin, as the clinical history shows, only this meningomyelitis has no characteristic anatomic features."

A still more recent writer on spinal tuberculosis is Haskovec.[30] He reports the following case from Charcot's clinic: The patient had phthisis but no evidence of syphilis. The nervous symptoms began with tingling in the feet, legs and anterior part of the thighs associated with some weakness in the lower limbs. After the lapse of a few months the legs became so weak within a few hours that the patient was unable to stand, and retention of urine and feces was observed. The paralysis in the lower limbs was flaccid and almost complete. This abrupt development of paralysis has also been noticed in tuberculous meningomyelitis by Hoche.[31] It is a frequent sign of spinal syphilis.

There was anesthesia of the lower limbs and lower part of the trunk in Haskovec's case, but no spontaneous pain and no fever. The upper limbs were not at first affected. The entire duration of the process was about four months. Leucocytic infiltration was found in the meninges, anterior and posterior spinal roots and cord, and especially within the septa and about the vessels. The neuroglia was proliferated. Disseminated tubercles were also observed. Examination was only made of the cord and sciatic nerves, but clinically there were no symptoms which pointed to cerebral involvement. Degenerated fibers, capillary hemorrhages and congested vessels were found in the cord. Haskovec could not succeed in staining the tubercle bacilli or any other micro-organism. He attributes the early numbness and weakness in the feet to the congestion of the meninges and the slight irritation of the posterior roots. This was essentially a case of spinal tuberculosis, for, although the base of the brain was not examined, no clinical symptoms had been observed which indicated cerebral involvement. There may, nevertheless, have been a latent basal meningitis. The case has many features similar to the one which forms the subject of this paper, though differing from it in certain details.

The thoracic region of the cord is the portion usually affected, according to Haskovec. He gives statistics from observations made in Prague. In 2090 autopsies on tuberculous patients the brain was found affected by the process in 100, brain and cord in 9 and in 6 of these cerebrospinal meningitis was found; the cord was affected in 12 cases, and in most of these caries of the vertebræ was observed. His statement in regard to the frequency of the process is contradictory to Raymond's, for he says that tuberculosis of the central nervous system is rare.

Haskovec states that until the time his paper was written, the tubercle bacillus had not been stained in any of the cases of nodular and infiltrating spinal tuberculosis which he had quoted, although it had been found in solitary tubercles. Schamschin says the bacilli were found in all his cases of tuberculosis, although in many of these solitary tubercles were present. Hoche (l. c.) with much difficulty was able to stain the bacillus in the pia, arachnoid, etc., in diffuse meningomyelitis.

Usually the nodular spinal tuberculosis presents the picture of acute myelitis. The picture given by Haskovec is as follows: The patient, who already has pulmonary tuberculosis, is seized abruptly with paresthesia, feebleness of the extremities, pain, etc. These symptoms last a certain time with remissions. Some day the patient is suddenly, partially or completely, paralyzed, sensation is altered, vesical and rectal trouble and trophic lesions are observed.

The fact that the tubercle bacillus has not been found in many cases of infiltrating and nodular tuberculosis (Haskovec) suggests the action of a poison upon the cord without the presence of the bacillus.

The effects of tuberculosis may be seen in the entire nervous system; it may not only cause minor forms of degeneration in peripheral nerves which produce no symptoms, but also severe inflammatory and degener-

[30] Ha skovec: Archives de Neurologie, 1895, xxx, p. 177.

[31] Hoche: Archiv für Psychiatrie, xix.

ative processes with the symptom-complex of multiple neuritis (Oppenheim[32]). Carrière[33] has found neuritis in tuberculous patients when the cord was normal. As he was unable to find the bacillus and to produce tuberculosis in guinea pigs after inoculation with portions of these altered nerves, he concludes that the neuritis was due to the tuberculous poison.

Case No. 4, reported by Schamschin,[34] is worthy of special mention. External tuberculous spinal pachymeningitis, with basal tuberculous meningitis was found. The meninges upon the pons were infiltrated with leucocytes. Specific tuberculous lesions—miliary tubercles and giant cells—were not observed microscopically in his sections from the pons, although macroscopically miliary tubercles had been noticed on the brain. Very little mention is made of giant cells within the cord. A slight degree of leucocytic infiltration was observed throughout the cord and its pial membrane. The spinal roots were also invaded by the cells. There were no miliary tubercles found within the cord or its pia, either macroscopically or microscopically. The statement is made that in the region of the pons the perivascular areas were infiltrated with leucocytes.

Hektoen[35] has called attention to the vascular changes in tuberculous meningitis. In all nine cases examined by him extensive vascular lesions were noted, and in only one of these was there evidence of mixed infection. In one of Hektoen's cases (No. 7) there were no distinct evidences of giant cells in any of the sections.

The findings in most cases of tuberculous meningitis, as given by Hektoen, are diffuse and circumscribed cell infiltration, with comparatively many giant cells and occasional districts of caseation and also much fibrinous exudate, all of which seems more marked at the base of the brain and in the beginning of the Sylvian fissures.

From the cases which have been quoted it will be seen that the absence of specific lesions in meningomyelitis, or the failure to stain the bacillus does not exclude the possibility of the tuberculous nature of the process. There are cases which seem to be due to meningitis and yet on examination no organic changes are found in the meninges. Some of these may belong to the form described by Quincke[36] as meningitis serosa. The French (Dupré) speak of *méningisme*. There are, on the other hand, mild grades of tuberculous meningitis which probably cause no symptoms.

In the case which forms the subject of this paper, tubercles were found in the lungs, spleen and liver, and some of the lymph glands were tuberculous. The brain and cord when examined in the fresh state were found congested.

We can only say with certainty that there was a condition of meningomyelitis of moderate intensity in a patient with disseminated tuberculosis, but we may add that just such a condition as this has been several times reported as tuberculous. It is true that tuberculosis, especially when the lungs and gastro-intestinal tract are affected, is liable to be a mixed infection, and there is a possibility that the toxins produced by other micro-organisms than the tubercle bacillus may have called forth this condition of spinal inflammation. Such micro-organisms, however, are not to be detected within the central nervous system in this case, and we must be content for the present with the statements made by certain writers that tuberculous meningitis may exist when the presence of the bacillus can not be demonstrated in the nervous system.

[32] Oppenheim: Lehrbuch der Nervenkrankheiten, p. 333.
[33] Carrière: Archives Cliniques de Bordeaux, September, 1896.
[34] Schamschin: Zeitschrift für Heilkunde, 1895, p. 373.
[35] Hektoen: The Journal of Experimental Medicine, Vol. 1, No. 1.
[36] Quincke: Volkmann's Sammlung klin. Vorträge, N. F. 1893, Innere Medicin, No. 67, and Deutsche Zeitschrift für Nervenheilkunde, 9 Band, 3 u. 4 Heft.

DISCUSSION.

Dr. JAMES HENDRIE LLOYD—This was a case of mine at the Philadelphia Hospital. It seemed very evident from a clinical study of the case that the man was suffering from some form of blood poisoning. He had not, clinically, the history of a multiple neuritis. He had a very remarkable condition of thickening of the whole vascular system which, considering that he was only 40 years of age, was quite extraordinary. It seemed to indicate that the vascular walls had been subjected to some kind of irritant which set up some form of thickening. We diagnosed tuberculosis, but at the time it did not occur to me as a possibility that tuberculosis could produce that train of symptoms, which in his case seemed largely to be confined to the motor neurons. After Dr. Spiller's study of the segments, however, I came to that conclusion. He had no lesions of syphilis and it remained for us to fall back upon tuberculosis.

Dr. HUGHES—You will recall the distinction that Gowers makes between neural and adneural states as the result of syphilitic infection, and that it is upon this fact in the earlier stages of venereal implication that we found our hope of cure and based our confidence in the possibility of a successful prognosis. Syphilis is an extra-neural or adneural affection.

Dr. PATRICK—Many of the symptoms of meningitis, whether tubercular or of the ordinary cerebral spinal type, or of some other source of infection, are sometimes due largely to something else than the discoverable lesion; that the principal symptoms are due to the systemic affection, or the action of the toxin upon the nervous system and not directly to the inflammation of the meninges.

I have been engaged for a number of months in the microscopic examination of specimens from a case of superior and inferior encephalitis. The patient died after six or eight weeks, from respiratory insufficiency. Macroscopically there was absolutely nothing to be seen; microscopically there was not very much. There is a marked dilatation and injection of all the arterioles of the bulbo-pontine region, also marked dilatation of the smallest arterioles, the largest vessels being very little affected. The nerve cells are almost intact. In many of the nuclei corresponding to the paralyzed areas, it is a question whether the nerve cells are normal or not; as far as the nerve fibers are concerned there are very few places that are even doubtful, and they are nearly all unquestionably normal. This was a case of toxemia of some kind, although no such source was discoverable, which acted upon the coats of the vessels, and which filtrated through and affected the nerve cells and fibers, causing paralysis and death, without any marked changes that are discoverable to the present technic. The case seems to be one that shows the intimate relation between the recognized organic and the functional cases. We know of an asthenic bulbar paralysis, with no findings by the best of men; we know apparently of a toxic disease, Landry's paralysis, sometimes with no findings; and now we know of an encephalitis, with punctate hemorrhages, with evidence of disease of a gross nature. It seems to me functional cases are simply toxemic, though not recognizable as such.

Dr. MOYER—I have recently seen a case which I regarded as a case of Landry's disease. There was an ascending paralysis beginning in the lower extremities; there were three distinct invasions of paralysis; two partial recoveries; and the third attack rapidly advancing to the involvement of the respiratory muscles and death. The whole history of the disease extended over forty days. Unfortunately there was no autopsy. The reflexes were at all times exaggerated to some degree; that is, the knee-jerk and deep reflexes. There was no ankle-clonus, however. This case was one that had all the phenomena of an infectious disease; coated tongue, disturbed alimentary tract, in a word, all the phenomena that you would expect to find in an ordinary case of typhoid fever, except that at no time during the progress of the malady was the temperature raised above normal. I could not escape the distinct impression that I was dealing with some unknown infection, and that some ptomain, some poisonous product formed by bacteria, on being absorbed either generally or in a localized way, was poisoning the nervous system of the patient. I have now under observation a child, only about 6 years of age, who presents a typical picture of the patient last described, and the malady

seems to be progressing in exactly the same way. In this child also there is absolutely no increase of temperature.

These nerve cells are simply poisoned by some ptomain, some toxin, and they do not present any structural changes any more than they would with aconite or strychnia poisoning.

Dr. SPILLER—In regard to Dr. Patrick's statement, I would say that one case of asthenic bulbar paralysis has been reported in which lesions were found. Landry's paralysis is probably due to different causes and different lesions.

A CASE OF TRANSVERSE MYELITIS WITH AN UNUSUAL FORM OF DESCENDING DEGENERATION IN THE POSTERIOR COLUMNS.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY JOHN K. MITCHELL, M.D., AND
J. H. WALLACE RHEIN, M.D.
PHILADELPHIA, PA.

The patient was a man aged 65 years, of great mental and physical activity, and in good health with the exception of the illnesses arising during army service and two or three wounds, one of which was received at Antietam, a fragment of shell striking him between the right shoulder blade and the spine. He was seized suddenly with pain in the area of distribution of the seventh intercostal nerves on the right side, about May, 1896. There was very great tenderness upon pressure or touch and extreme sensitiveness to variations of weather. The pain exhibited an extraordinary obstinacy to treatment, so far as could be learned from the patient's statements.

He was treated by the family physician (a homeopath) for intercostal neuralgia without experiencing any relief. The pain continued in varying degrees of severity, but was never absent during the whole spring and summer; it was often so great as to practically incapacitate him, and he was obliged to give up his business and go away in the hope of getting better.

Other physicians saw him in the course of the disease and gave the opinion that he was suffering from intercostal neuralgia.

In September a pain of somewhat less violent character began in the same situation on the left side. The measures taken to relieve it included continuous pressure upon the painful points, which made it worse, and various drugs. He returned home and went to bed. There was no change in the general symptoms, except for a temporary increase or decrease of pain, until the latter part of November. November 30, upon attempting to rise in the morning, he was quite suddenly seized with loss of power in the legs. This loss did not seem absolute, however, as he could move the legs a little while lying in bed. There was no impairment of control of bladder and rectum.

The physician called in consultation (a homeopath) stated that the knee-jerks were decidedly present, and that the patient was able to move his legs a little.

One of us saw him first three days later. He was then lying upon his back quite unable to move and suffering constant acute pain in the intercostal nerves.

There was very slight knee-jerk on both sides, and the plantar jerk was also present, somewhat stronger upon the right than upon the left side; no cremaster reflexes were demonstrable. The bladder and rectal control was unaltered. There was fair localization to touch on both legs. He was beginning to complain of pain at the level of the sacrum, and the sacral region was quite sensitive. This sensitiveness increased upward over the whole abdominal region until it became hyperesthetic at the level of the intercostal trouble. There was no fever and the lungs and heart appeared perfectly sound to repeated and careful examination, a point of interest in view of the condition found at the autopsy. Upon examining the patient's back an ill-defined resistance on the right side of the column over an area which covered the levels of the fifth, sixth, seventh and eight dorsal vertebræ was readily made out. This increased resistance was decidedly less marked upon the left side than upon the right. Percussion over the same area gave a slight increase of dulness; the limitations were vague even with careful examination with the phonendoscope. No change in this condition was noticed for several days, but in less than a week the knee-jerk had entirely disappeared and no reinforcement was obtainable. Control of the bladder and rectum was now lost, the urine having to be drawn and the bowels moved by enemata. The patient still complains of pain in the intercostal regions and immediately below, especially if the bowels were not kept freely open. In that event an accumulation of gas would distend the abdominal walls and cause increasing pressure upward with consequent pain. One or two small bed sores appeared, but careful nursing resulted in healing for a time. In spite of care, however, after some weeks a large slough formed upon the sacral region and another upon the left buttock. These were followed by others, and the patient died from exhaustion January 15.

It had been our theory from the first that the trouble was in some indirect way due to the spinal injury received from the shell wound at Antietam, and this opinion was founded upon the observation of several cases previously seen, where spinal wounds which at first seemed to be only moderately severe concussions had many years after (twenty-seven years in one case, twenty-five in another) determined degenerative changes quite sudden in onset.[1]

The autopsy furnishes points of great interest. The specimens were stained by various methods to exhibit the several forms of degeneration and a full report of these studies follows:

Autopsy. Twenty-six hours after death. On exposing the column it presented no external deformity. After section the fifth, sixth and seventh dorsal vertebræ were seen to be surrounded with pus. A sac extended on both sides of the column from about the middle of the fifth to the lower margin of the seventh. It burrowed deeply on the ventral side of the column and extended irregularly in a lateral direction, but did not reach the level of the dorsal aspect. The laminæ were soft and broke under the saw; all the surrounding tissue, outside as well as inside, was matted and thickened with caseous material, resembling broken down tubercular deposit.

Dissecting the tumor away from the sides of the column, a finger could readily be passed into the posterior mediastinum at this level. The tumor had distinct outline but was not sacculated. The laminæ and spinous processes were all involved and much necrosed and disorganized. The fifth and sixth vertebræ were especially broken down, the spines less than the bodies. The posterior roots of the eighth pair of

1 Several of these cases are fully reported in a small volume by Dr. J. K. Mitchell, on "Remote Consequences of Injuries of Nerves." Lea Bros., Phila., 1896.

nerves were much enlarged and thickened at their exit from the column, the sheath being especially indurated, and measuring one-quarter centimeter in diameter. The rib articulations to the fifth, sixth and seventh vertebræ were necrosed. It was necessary to separate the dura, by dissection, from the caseous mass of which it seemed to form a part, and even above the level of the tumor it was decidedly adherent. The vertebral destruction was much more marked on the right side than on the left.

Upon opening the cord the dura was found thick and tough, in many places more than one centimeter in thickness. In the region of the tumor the cord was flattened laterally. It was dotted with a creamy semi-fluid material in spots and so broken down that it could not be cut.

There was no other marked macroscopic change, except that the cord seemed to be gray in color. There were a few small tumors scattered throughout the lungs and many of the posterior mediastinal glands were enlarged. The other organs presented no abnormality. The appearance was very much like that of tubercular disease of the bone with exudation around the focus of the disease; but sections from the spinal tumors proved it to be a sarcomatous growth. The tumors in the lungs were evidently the result of metastasis.

The spinal cord was placed in Müller's fluid. The cord was so soft and disintegrated at the level of softening that it was not possible to make any sections from this part. This softening extended a distance of five to six centimeters. Sections were made immediately above and below the softened area and from other levels above and below and stained by the Weigert-Pal method, by carmine and by the Marchi method. The dura mater was irregularly thickened about the softened portion varying in thickness in the crossed section from one to nine millimeters. The cord was not greatly narrowed, but was somewhat flattened. In a recent state it was soft and pulpy.

Microscopic examination (Weigert-Pal method) gave evidence of extensive degeneration in the posterior columns immediately above the softening, involving the columns of Goll more intensely than those of Burdach. With the exception of a narrow band adjoining the posterior horns, the whole extent of the latter columns was involved. The direct cerebellar tracts were moderately involved. Gowers' columns were quite markedly degenerated, the direct and crossed pyramidal tracts remaining practically free. Above this in the lower cervical region the posterior columns were intensely involved, more especially the columns of Goll. Quite a distinct line could be observed between Burdach's and Goll's columns, but the former were also affected, though less severely. There remained many well stained fibres adjoining the posterior roots. The pyramidal tracts were exempt. On both sides the direct cerebellar tracts were involved to a moderate degree, and Gowers' column quite markedly, except at that portion adjoining the crossed pyramidal tracts. Farther up in the cervical region the degeneration was localized in the posterior columns, almost entirely to the postero-median columns, the line between these and the healthy postero-external columns being quite distinct. Gowers' and the direct cerebellar tracts were more intensely degenerated.

In the dorsal region a short distance below the softening, there was a moderate amount of degeneration in the postero-median columns at their anterior second and third fifths and this extended over on one side as far as the anterior horn and was quite marked; on the other side the process was slighter in degree. In the crossed pyramidal tracts there was a moderate degree of degeneration on both sides, extending well forward and also in the anterior pyramidal tracts. Lissauer's tracts on both sides were moderately involved. The posterior and the anterior roots were both degenerated at this level.

In the lumbar cord in the upper levels the posterior tracts were apparently exempt. The crossed pyramidal tracts were moderately degenerated, and the posterior root zones were involved.

In the lower lumbar cord the lateral columns were still affected, the remaining portions of the cord staining well everywhere.

In the sacral cord the descending degeneration was still traceable in the lateral columns.

In the cervical region the anterior roots showed increase of the connective tissue, and degeneration of the nerve fibres, though this was not extensive. The same thing may be said of the posterior roots below the softening in the lower thoracic cord and also, to a much less extent, of the anterior roots. In the lumbar region the posterior roots were markedly affected, the anterior remaining practicaly free.

Showing Schultze's tract; 9th thoracic.

Upper lumbar. Sacral.

Showing descending degeneration in posterior columns.

Microscopic examination by the Marchi method showed recent degeneration. Above the softening the whole extent of the cord showed recent changes but especially in the columns of Goll, Gower's columns, and the direct cerebellar tracts, where they were very intense. Higher up the degeneration was less marked, but still present everywhere. Around the periphery of the cord and in the posterior columns it was still quite extensive. Below the softening the acute degeneration invaded the entire cross section of the cord with the exception of a small focus behind the crossed pyramidal tracts. The degeneration was profuse throughout the posterior columns save centrally where the middle two-fifths seemed practically exempt. The anterior and posterior roots shared in this acute inflammation and the reflex collaterals were also involved. In the antero-lateral tract between the direct pyramidal and direct cerebellar tracts there was slight degeneration in an area corresponding to the descending antero-lateral tracts of Foster.

In the dorsal region further down there was slight degeneration on either side situated behind the knee of the posterior horns. Throughout the whole tract, however, there was a slight diffuse degeneration; and

on one side this was more intense in the area corresponding to the comma shaped tract of Schultze. This was about the ninth thoracic segment. In the upper lumbar region this had disappeared. A slight degeneration was seen, limited to that part of the postero-median column adjoining the posterior median fissure, more intense at the periphery, disappearing about half way between the periphery and the posterior commissure. Clarke's columns were not involved.

In the sacral cord the same degeneration was observed in the portion of the posterior column bordering on the posterior fissure. It was club shaped and extended slightly farther forward than in the upper level.

Carmine stain.—The carmine section showed much increase in the connective tissue in the posterior tracts. The nerve fibers had undergone extensive degeneration, were fused into masses and had lost all resemblance to their original appearance. There were numerous blood vessels with thickened walls, some were obliterated, the walls of others crowded with nuclei. This change existed, though to a less extent, in the lateral, and still less in the anterior tracts. In the gray matter there was intense change and the ganglion cells were profoundly degenerated. The angles were rounded, the prolongations lost in many; others showed granular change and appeared globular in form, containing elongated nuclei. There were numerous capillaries and small vessels and an extreme degree of round-celled infiltration existed. Occasionally a ganglion cell was found in fair condition, but this was rare. In the cervical region higher up, a similar change was observed. Hemorrhages into the gray matter were present, but the ganglion cells were less extensively involved, in many the prolongations persisting. There were numerous capillaries choked with red blood cells. The axis cylinders in the anterior roots were swollen in many places and some had disappeared. In the posterior roots there was an increase in the connective tissue and many swollen axis cylinders were present.

Immediately below the softening the condition was similar to that described, as existing immediately above it. The whole transverse area was degenerated in a diffuse manner. In the upper lumbar level the change in the gray matter was very much less extensive, most of the ganglion cells retaining their normal characteristics. In the sacral region the gray matter was the seat of slight inflammatory change. A number of capillaries filled with blood cells were seen and also a considerable amount of round-celled infiltration. A number of ganglion cells were rounded, but most of them retained their prolongations.

In this case the usual ascending and descending degenerations following a transverse lesion of the cord were present. The ascending degeneration involved the posterior columns, especially Goll's tracts, the cerebellar tracts and Gowers' columns. Below the lesion the pyramidal tracts were degenerated along the entire extent of the cord. There were a few fibers between the anterior lateral tracts which were diseased, corresponding probably to those described by Foster as the "descending antero-lateral tracts." In the posterior columns in the lower dorsal region was a wedge-shaped area of degeneration situated in the postero-external tracts just behind the knee of the posterior horns on one side, spreading faintly into a comma-shaped area corresponding in position to that described by Schultze. In the lumbar and sacral regions this was not present, but a small area of degeneration was seen adjoining the posterior fissure on each side at the peripheral half and taking the shape of a club in the sacral region.

This descending degeneration in the posterior columns is exceedingly interesting, corresponding in many respects with that already described by a small number of observers. The descending degeneration in the posterior columns which occurs in the cervical and upper dorsal regions was described first by Schultze[2] in 1883, who called it the "comma-shaped column." But Bastian[3] in 1867, Kahler[4] and Pick, and Strümpell[5] in 1880, had already described a descending degeneration in the posterior columns. This tract has since been described by Westphal,[6] Tooth,[7] Schmaus,[8] Brunn,[9] Pfeiffer[10] and Daxenberger.[11] According to Obersteiner this tract is seen when the cervical cord is destroyed and does not extend below the upper dorsal region. Daxenberger claims that it descends the entire length of the cord; but in Strümpell's case it did not reach below the seventh dorsal nerve; in Schultze's case not below the middle dorsal, and in Tooth's case it was not found below the eighth dorsal segment. Dexler[13] found the column (Schultze's) in the spinal cord of a dog which was compressed at the lumbar swelling. Bischoff,[14] in a case of compression of the cord in the upper thoracic region, described the comma-shaped tract in the posterior columns which did not extend below the eighth thoracic segment. Below this there was a diffuse degeneration about the middle of the postero-median septum. In the lumbar region the fibers were brought together and collected against the dorso-median border. This diffuse degeneration extended from the eighth thoracic segment to the sacral region.

In our case there was seen what was probably the terminal portion of this tract at the lower dorsal segment. Beginning a short distance below this was a second tract of descending degeneration, limited to that part of the posterior median tracts adjoining the posterior median fissure and extended from the periphery to half way between this and the posterior commissure. It occurred in the lumbar and sacral regions only. In the sacral region it was more marked and became club shaped. This tract has been described only by a few observers. Obersteiner mentions it in his "Nervösen Centralorgane." He states that it begins in the lumbar region as a small strip bordering on the posterior septum and takes the shape of a club in the sacral region, where it is particularly marked. It finally appears as a three-sided area along side the median line and corresponds to the oval field of Flechsig. Obersteiner calls it the "dorso-median sacral bundle." Tooth does not mention this tract in his Gulstonian lectures, delivered in 1889, though he refers to Schultze's tract, and it has also escaped description in Quain's "Anatomy." In a case recently reported by Bruce[15] and Muir, in

[2] Schultze: Arch. f. Psych., 1883, p. 309.
[3] Bastian: Med. Chir. Trans., 1867, p. 499.
[4] Kahler and Pick: Arch. f. Psych., 1880, p. 178.
[5] Strümpell: Arch. f. Psych., 1880, p. 676.
[6] Westphal: Arch. d. Psych., 1880, p. 797.
[7] Tooth: Brit. Med. Journal, 1889, p. 827.
[8] Schmaus: Virch. Arch., 1890, p. 326.
[9] Brunn; Arch. f. Psych., 1893, p. 759.
[10] Pfeiffer: Deutsch. Zeit. f. Nervenheilk., 1891, ii, p. 345.
[11] Daxenberger: Deutsch. Zeit. f. Nervenheilk., 1893, iv, p. 136.
[13] Dexler.
[14] Bischoff: Wiener Klinisch. Woch., 1896, p. 830.
[15] Bruce and Muir: Brain, 1896, lxxiv-v, p. 383.

which there was an injury to the cord at the tenth dorsal vertebra, a descending tract was found very similar to that described in our case. The degeneration was irregularly spread throughout the greater part of the posterior columns in the upper lumbar region. It then became located in the vicinity of the postero-median septum and the periphery of the inner half of the posterior commissure and finally took the form of a wedge with its base toward the periphery and apex toward the commissure. Its fibers terminated in the gray matter at the base of the posterior horns on the same side. It seemed to Bruce and Muir that this tract was independent of Schultze's comma-tract and also of the cornu-commissural tract of Marie. They believed it to correspond to Flechsig's "oval field" and Obersteiner's "dorso-median sacral bundles." They call this the "descending septo-marginal tract," which seems a very appropriate name.

In the case reported by Déjerine and Spiller[16] in which there was a lesion of the cauda, an ascending degeneration was observed occupying the whole posterior column with the exception of the oval field of Flechsig; this could not be found above the first lumbar segment. It has been claimed that Schultze's tract is composed of the descending fibers of the posterior roots, but in a case reported by Tooth in which the fifth thoracic nerve was degenerated this tract was not present.

The absence of knee-jerks one week after the onset of spinal symptoms is interesting in relation to the question raised by Bastian,[17] who first called attention in 1882, to this association of absence of the knee-jerks with total destruction of the cord (Quain's Dictionary). The statement was viewed with a great deal of skepticism on the part of many observers and has not yet been universally accepted. Again, in 1890[18] he reported cases illustrating this condition and also referred to cases of Tooth, Kahler and Pick, and Thorburn, in which the reflexes were lost in transverse lesion of the cord due to fracture dislocation. On the contrary, Gowers claims that reflex action is excessive except when the disease involves the lumbar enlargement.

Bischoff (*Wien. Klin. Woch.*, October, 1896), in a review of the literature of the subject collected thirty-one cases. He concluded that the reflexes are either lost from the beginning, or first increased and later lost in a certain percentage of cases. The reflexes were increased in two cases of complete destruction of the cord. An autopsy was made in only one of these cases in which the ganglion cells and crossed pyramidal columns were found diseased. In three cases of incomplete destruction, the reflexes were not lost. There was no autopsy in these cases. The author concludes that the reflexes may be lost when the lesion has not been complete, or may be present when the lesion has been total. He believes that the lessened reflexes are due to a condition independent of the spinal lesion, its completeness or its height, and of the ensuing degeneration. He holds that there is a paralysis of the vasomotor nerves supplying the abdominal viscera and the lower portions of the body and also of the motor and sensory fibers, causing dilatation of the vessels in these parts, and lowering of the general blood pressure. The anemia thus produced lowers the vitality in the lumbar region and hence the tendon reflexes are lost. On the other hand, Habel (Archiv f. Psychiatrie, 1897) reports thirty-one cases of which three were examined microscopically; in eight the reflexes were lost. He concludes that the tendon reflexes are lost when there is compression or total destruction of the cord, in the cervical and upper thoracic regions. He claims there is not constant loss of skin reflexes. The tendon reflexes in the case reported in this paper were lost and there was also degeneration of the gray matter and of the posterior root zones in the lumbar cord. Brunn (Archiv Psychiatrie Nervnhl., No. 25) reports a case of complete traumatic destruction of the spinal cord in the lower cervical and upper dorsal region in which the knee-jerks were lost. It is evidently essential to the decision of this question that a number of cases should be studied accurately, clinically as well as histologically. It is alike impossible to determine without an autopsy of any case of fracture, dislocation or compression myelitis, whether the lesion is limited to one spot, or to determine the amount of secondary degeneration which may follow destructive lesions.

[16] Déjerine and Spiller: Comptes Rendus d. l. Soc. d. Biologie, 1895, p. 27.
[17] Bastian: Quain's Dictionary of Medicine, p. 1480.
[18] Bastian: Medico-Chirurgical Transactions, London, 1890, Vol. 73.

NEURASTHENIA ESSENTIALIS AND NEURASTHENIA SYMPTOMATICA.

Presented in the Section on Neurology and Medical Jurisprudence, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY F. X. DERCUM, M.D.

CLINICAL PROFESSOR OF NERVOUS DISEASES, JEFFERSON MEDICAL COLLEGE; NEUROLOGIST TO THE PHILADELPHIA HOSPITAL.

PHILADELPHIA, PA.

At the present day there exist, not only in the mind of the general practitioner, but even in that of the specialist, the most vague and ill defined notions concerning neurasthenia. Not only do we hear from physicians of the highest standing allusions made and views expressed in regard to neurasthenia which disclose that this all important affection has never received serious study or attention by them, but this is true to a very large extent of neurologists and especially alienists. A striking illustration of this proposition is furnished by the treatise on the pathology and therapy of neurasthenia, by Binswanger, which has recently made its appearance in Germany. This writer does not hesitate to say that under neurasthenia we are to group all neuropathic appearances which rest on a basis of a general functional disease of the nervous system but which can not be placed in the same category with the fully developed psychoses and neuroses because of their incomplete character. Surely the pages of medical literature have never before proposed, as the definition of a well defined and well known syndrome, such as neurasthenia certainly is, terms more vague or more unsatisfactory. It is largely because neurasthenia, to the superficial observer, seems uninteresting, that it is so little studied, and yet it is an affection so common, the number of cases so large, that we certainly owe it to ourselves to obtain clear, if not elementary, notions of this disease. In truth, neurasthenia is one of the most interesting affections which we can possibly study. As I will point out, its syndrome is as definite and fixed as that of any other disease with which we have to deal. Its boundaries instead of being illy defined are sharply delimited. The various symptom-groups occurring in neurasthenia, though differing widely in detail, always present

the same essential features and, from whatever standpoint they are approached, a harmonious clinical whole—a well proportioned and well defined syndrome—is seen. The work of Binswanger illustrates in reality a backward step. If it is to stand, the writings of Beard, Bouveret, von Hösling and others to whose labors we owe, in a large measure, our present notions of the disease, fall to the ground, and all the value of the pioneer treatise of Robert Whyte, now over a century and a quarter old, which differentiates this affection clearly from the allied conditions of hysteria and hypochondriasis, not to speak of the writings of Sandras, Bouchut and others, disappears.

Let us analyze briefly the essential features of neurasthenia. In the simplest form of the affection there exists a more or less marked and persistent diminution of nervous energy, and to these symptoms are added those of increased irritability both mental and physical. It does not seem that much mystery should attach to this condition; it hardly seems necessary to contend that marked chronic fatigue should present a special syndrome, and yet Binswanger would have us believe that we are dealing with a condition which presents the most vague and indefinite symptomatology. These vague notions of neurasthenia are based upon incomplete study and upon the apparent inability to systematically arrange and properly classify the facts presented. Neurasthenia is still in the position in which hysteria was until recent years in England and America, notwithstanding the French had demonstrated unmistakably the symptomatology of the latter affection. Too often neurasthenia is looked upon as a vague affection made up of numerous pathologic factors bearing little or no relation to each other. The difficulty partly arises from the fact that the symptoms of neurasthenia are in a large measure subjective, while even such symptoms as are objective lack the striking features observed in many other functional diseases. Another circumstance which has been most prolific of misconception regarding the nature of neurasthenia is that physicians have loosely described as neurasthenia symptoms which properly belong to other diseases. Thus the nervous symptoms associated with anemia, chlorosis and other diseases of the blood, the nervous symptoms associated with the diseases of the pelvic organs or with chronic diseases of the stomach, have been loosely termed neurasthenia. If the nervous symptoms associated with general somatic or organic diseases are to be termed neurasthenic, we should be careful to bear in mind that they represent something very different from true neurasthenia. I have proposed for this spurious neurasthenia the term neurasthenia symptomatica. If the fact that there exists a true neurasthenia separate and apart from symptomatic neurasthenia, is once firmly fixed in our minds, much of the confusion clinging to the subject passes away.

The next fact of importance to recognize is that in true neurasthenia, or as I prefer to term it, neurasthenia simplex or essentialis, in addition to symptoms primarily indicative of the disease, others make their appearance which are secondary in character and importance. Frequently these secondary or subsidiary symptoms are superficially evident or unusually prominent, and thus their importance is mistaken and overrated. Charcot also recognized these differences in the symptoms of neurasthenia, for he separated the symptoms into cardinal symptoms or neurasthenic stigmata and accessory symptoms. In Charcot's group the fundamental symptoms or stigmata are the following: 1, neurasthenic headache; 2, sleep disturbance; 3, rachialgia and spinal hyperesthesia; 4, muscular weakness; 5, the disturbances of digestion (nervous dyspepsia); 6, sexual disturbances; 7, mental symptoms. To these Charcot added the secondary or accessory symptoms, which group consists of all those not essential to the diagnosis of neurasthenia. Among them he placed such symptoms as giddiness, disturbances of the special senses, respiratory, circulatory and secretory, disturbances of general sensation, of motility and febrile conditions.

Charcot in his classification of the symptoms of neurasthenia merely grouped together as the stigmata, or fundamental symptoms, the most prominent clinical features of the disease. We will find by analysis that these symptoms are not of equal value, and this is also true of the secondary symptoms just enumerated.

If we grasp the conception of neurasthenia, that it is in reality a fatigue neurosis, the symptoms group themselves very readily in a logical and orderly sequence. Primary or fundamental symptoms then stand out boldly and with definite relations to each other. They are always symptoms which present the characteristics of weakness and irritability and which are always expressive of fatigue. The secondary symptoms are all such as are adventitious or mere secondary outgrowths of the primary. I can make my meaning clear by enumerating some of the various primary and contrasting them with some of the secondary symptoms. Beginning with the sensory disturbances we have, first, a general sense of fatigue. This sensation may be diffused throughout the entire body, but it is generally accentuated in special regions or limbs. It is characteristic of this sense of fatigue, whether it be referred to the head, to the back or limbs, that it is, in the simple and typical cases at least, always relieved or lessened by rest, and further, it is always brought on if absent, or made worse if present, by exertion. This readiness and general sense of fatigue I regard as the primary symptom, if indeed not the most fundamental of all the symptoms, of neurasthenia. Fatigue sensations when exaggerated become painful and are then described by the patient as aches of various kinds. It is frequently a headache, almost as frequently a backache, or the ache may be referred to a leg or to an arm. In the latter instance a few questions with reference to the avocation will almost always reveal the reason for the accentuation of the pain in one extremity. Thus, in a collector, the fatigue sensations were most pronounced in the legs; in a physician who used his right hand constantly and for many hours daily in laryngeal manipulations, the fatigue sensation was accentuated in the right arm.

These aches of various kinds are primary symptoms. Not infrequently, however, we have associated with these symptoms others which are secondary and which I have termed adventitious. Thus, the headache of neurasthenia may be accompanied by a sense of pressure or constriction or of fulness, lightness or distension. These sensations, depending as they probably do, upon disturbances of the circulation, are secondary and adventitious. They are not necessary parts of the neurasthenic headache and may or may not be present. Sometimes other sensations are noted, such as throbbing, sense of increased weight, whirling sensations, or vague and ill defined feelings of distress; all of these are secondary in value.

As regards backache, the simple feeling of fatigue referred to the lumbar region may be complicated by hyperesthesia, especially over the spinal gutter, where it may be distributed in patches; I refer to so-called spinal hyperesthesia or spinal tenderness. This I regard as a secondary symptom. It is a pathologic exaggeration or intensification of the fatigue sensation. The hyperesthesia, the sense of burning and the deep-seated boring pains sometimes complained of, are clearly adventitious and not primary. The achings referred to the legs or arms, present a similar illustration. It is very frequently found that in addition to, or in place of aching in the limbs the patient complains of throbbing and tremulous feelings. They are not necessarily present and are clearly adventitious. The various curious paresthesiæ of which neurasthenics complain, such as numbness, prickling, or of velvety sensations, all belong to the group of secondary symptoms.

If we analyze the various visual disturbances of neurasthenia we find that the same truth is evident. Here the principal symptoms are those expressive of fatigue. I will not analyze them in detail, but allude briefly to a few of them. One of the most common statements made by neurasthenics is that they are not able to read for more than a few minutes at a time, and if they persist, the letters become blurred and indistinct and the effort gives rise to pain, generally headache. It is probable that in this symptom there is involved a three-fold weakness of retina, muscular apparatus and cerebral centers. Irritability is noticed in the fact that many neurasthenics are unable to withstand any but the slightest exposure to light on account of the painful sensations produced. It is for this reason that so many neurasthenic subjects spontaneously begin the use of smoked glasses. Ready fatigue and irritability are primary symptoms; others are frequently present; thus, patients will declare that everything appears as though seen through a mist or veil, or that objects look exceedingly dull or unusually bright, or as though they were far away or at times excessively large. All of these symptoms are secondary in value; they are all adventitious to the primary symptom, visual fatigue.

The same difference also obtains with regard to the disorders of hearing. Slight impairment of hearing coupled with auditory hyperesthesia, great irritability to sounds, obtain in a very large number of cases, and these symptoms are primary and fundamental. In addition, paresthesiæ are frequently complained of. They consist of various forms of tinnitus, such as roaring, buzzing, whistling sounds and at other times of throbbing, beating or tickling sensations. These are beyond doubt adventitious and bear but a secondary relation to the fatigued condition of the auditory apparatus. I might point out similar disorders presented by the senses of smell and taste. I need only briefly allude to the excessive sensitiveness of some neurasthenic patients to odors and also to the fact that olfactory paresthesiæ sometimes occur. This is equally true of the sense of taste. The accuracy of the latter is often distinctly lessened and very frequently paresthesiæ are present, so that common articles of food present strange and often disgusting flavors.

When we turn to the motor phenomena we find that these also resolve themselves into primary and adventitious symptoms. Muscular weakness is so pronounced a symptom of the average case of neurasthenia that it was constituted by Charcot one of his fundamental symptoms or stigmata and termed by him *amyosthenia*. This is a primary symptom, and yet it is frequently associated with other symptoms, such as tremor, which may present itself in a characteristic manner as a fine intention tremor of the hands or it may be limited to certain groups of muscles or even to a few fibers of a muscle. When present as an intention tremor it is most readily demonstrated in the extended hands. When limited to special bundles of fibers it is most frequently observed in the muscles of expression, notably in recurring twitchings of the orbicularis palpebrarum or of a few fibers of the frontalis or the orbicularis oris. These intention and fibrillary tremors are evidently not primary but adventitious and secondary. The term primary should be restricted to the amyosthenia itself.

When we turn to the disturbances of digestion, of circulation, of secretion and of the sexual functions, the same general truth is noted. Regarding digestion, the primary symptom is that of digestion enfeebled and delayed, *i. e.*, atonic indigestion—an indigestion also associated with an atonic constipation. The secondary symptoms that sooner or later make their appearance are those of a gastric catarrh, the result of abnormal fermentation accompanied by the formation of abnormal acids. Evidently gastric catarrh with its abnormal acidity, excessive or diminished, is a secondary or adventitious condition. The disturbances of the circulation afford another illustration. The coldness of the extremities, the feebleness of the pulse, are primary symptoms and expressive of general weakness. The disturbances in the rhythm as manifested by irregular action of the heart or of cardiac palpitation, are to be regarded as adventitious symptoms. The circulatory apparatus, together with the nervous mechanism controlling it, is in a condition of irritable weakness and that, as secondary outgrowths of this irritable weakness, there should be gross disturbances of its rhythmic action, is not surprising, but these disturbances must be looked upon as secondary and not essential to the clinical picture of neurasthenia. The disorders of rhythm may be so great as to mount to most frightful attacks of tachycardia. The various heart murmurs that are occasionally noted in neurasthenic subjects are likewise to be relegated to the secondary group, as are also the loss of vasomotor tonus, as made evident by involuntary flushings of the face or other portions of the body, or on the other hand by such symptoms as aortic pulsation.

The sexual disturbances also reveal as primary symptoms, weakness and irritability, and in addition, as secondary symptoms, various paresthesiæ, such as pricking, creeping, throbbing or cold sensations. The secondary symptoms are indirect outgrowths of the primary weakness and irritability.

The psychic symptoms of neurasthenia can be isolated with the greatest readiness. The first symptom that we note is the diminution in the capacity for study or intellectual effort. To attempt to do mental work, sooner or later brings on in the neurasthenic symptoms of exhaustion. If the task be persisted in the fatigue sensations become very pronounced and in addition to headache secondary symptoms, such as sensations of constriction, giddiness and even vertigo, make their appearance.

The next symptom is also one indicative of weakness. It consists in a lack of the power of concen-

trating the attention, and this the patient frequently mistakes for loss of memory. Other symptoms of weakness are lack of spontaneity of thought, a diminution in the strength and emotional irritability. These symptoms are all referable to the primary group. In a large number of patients, however, other symptoms make their appearance, which are clearly secondary in character; associated with the general incapacity for exertion, the weakness of concentration and lack of spontaneity, there is often an apparently causeless, general sense of fear. This may be vague and ill defined and consist merely of a general feeling of anxiety. More frequently, however, it takes some definite form. The patient experiences a sudden sense of fear which is uncomplicated and may be slight or so intense as to be horrible and overwhelming, or instead, we may have the special fears which have been described by various writers, notably by Beard. They find an apt illustration in the fear which a perfectly healthy person experiences when standing at a great height, even though they know themselves to be in a perfectly secure position. In neurasthenics these special fears assume the most aberrant forms. It is hardly necessary in this connection to refer to agarophobia, claustrophobia and their congeners. Let it suffice to say that all the forms of fear, from the simple and purely generalized to the most highly specialized, all belong to the secondary group of symptoms. For some reason Charcot placed the various special forms of fear presented by neurasthenics in a third group of symptoms, but certainly, if we regard neurasthenia as a fatigue neurosis with secondary outgrowths and complications, this formation of a third group of special mental phenomena is not justified.

Neurasthenia is not a vague and ill-defined affection, as Binswanger would have us believe. I contend that it is an affection with a syndrome as well defined and established, as any with which we have to deal. The moment we regard neurasthenia in its true light, that of a fatigue neurosis, much of the mystery passes away and the essential symptoms, those directly expressive of fatigue, stand out prominently and give to the disease its clinical features. The failure to assign to the secondary symptoms their proper value has been a prolific source or error. Often these secondary symptoms are quite prominent but they should not throw us off our guard. If the case be one of neurasthenia some of the primary symptoms can always be found.

If time permitted I would invite your attention to the pathology of true neurasthenia, to the studies of Hodge with regard to the changes which nerve cells undergo during fatigue and also to the histo-chemistry of neurasthenia—upon the probable source of the uric acid which is so often found in excess and to point out how these factors enable us to draw still more clearly the differences between true neurasthenia and neurasthenia symptomatica. Finally permit me to allude to a condition which I have called "neurasthenia terminalis." It is well known that prolonged and persistent derangement of function may be followed by actual tissue changes. Thus a heart which is constantly overacting, the result of repeated and violent attacks of palpitation, may undergo hypertrophy, or the walls of the blood vessels may become thickened and if the case persists sufficiently long and be associated with deranged tissue metabolism, even atheromatous changes may take place in the vessels; or, if digestive disturbances persist sufficiently long, secondary terminal organic changes may occur in the digestive tract. That organic changes may also occur in other structures such as the muscles and even the bones, there can be little doubt. These changes are often suggestive of premature senescence. When any of these changes are present in a marked degree the case is classed by us, clinically, according to the diseased condition which predominates. In other words, simple and uncomplicated neurasthenia, if it persists long enough, results in actual tissue changes, and if the patient presents himself before these changes are accentuated in any one organ and they are slight and generalized the case should still be considered as neurasthenic, but be regarded as the terminal form. These are the cases which are largely intractable to treatment.

My object in this paper was merely to present in as condensed a way as possible my own interpretation of the symptomatology of neurasthenia and was prompted especially by the publication of Binswanger's untenable and retrogressive views. I intended to point out the difference between true and spurious or symptomatic neurasthenia and also to give to neurathenia its proper position in our nosology as a fatigue neurosis.

DISCUSSION.

Dr. THAYER—I had a patient suffering from headache and general prostration. She consulted various prominent neurologists and one pronounced it nervous prostration, another thought it was neurasthenia and another called it hysteria. These affections have symptoms in common, but neurasthenia must certainly rest upon definite symptoms and definite pathologic conditions of its own and must not be confused with hysteria or chorea or anemia.

Dr. CANFIELD—I think that when a physician has to deal with a neurasthenia of considerable duration he is often called upon to treat what has developed later as hysteria, and perhaps the reverse might be true. In some cases it is immaterial whether you diagnose it as hysteria or nervous prostration, so far as the treatment is concerned at the time. The "tired feeling" is the absolute criterion of neurasthenia.

Dr. LICHTY—From particular study of the secretions and of the blood in so-called neurasthenia, I have discovered that perhaps 50 per cent. of the patients suffering from this disease would be more properly classified as anemics or lithemics. When we go further into the study of neurasthenia we will reduce the number of neurasthenic patients and place them in the right category, neurasthenia essentialis being a clearly defined disease.

Dr. BELL—These cases suffer more or less from anemia in some form, and also from derangement of digestion, either stomachic or intestinal, and in order to locate the trouble it is absolutely necessary to interrogate every organ. There are cases in which the digestive difficulty is not present. I was under the impression that Dr. Vandusen of Kalamazoo was the first to describe this disease. The uric acid diathesis and the formation of chlorids are prominent factors in this disease.

Dr. MARGARET A. CLEAVES—I have found that careful attention to the matter of diet and the proper mental and moral care of these patients is of paramount importance. I have used for a number of years, with very great advantage, a combination of electric treatment with rest cure. I have known two cases of neurasthenia to go to the extent of exhaustion of the motor center so that for a long time it was impossible for the patient to stand or walk. There is no doubt that the factor of worry and anxiety has much to do with the production of the true neurasthenic state. In neurasthenia essentialis, due to exhaustion of the brain, I believe strychnia to be the worst drug that can be used.

Dr. HUGH T. PATRICK—I have come to the positive conclusion that there are at least two distinct groups of neurasthenics. The one is in every particular a fatigue neurosis—a nervous exhaustion produced by overtaxing the brain (not the spinal cord). Patients of the other class present almost exactly the same symptoms, but they arrive at the same goal by a different route, by the action of an inadequate cause. For instance, a laboring man overlifts and then develops, one by one, the cardinal symptoms of neurasthenia, by the action of sub-conscious conceptions in his cerebrum. Possibly the rest cure will benefit this man, but if it does it will only be because of its effect upon his mental state. Most of these patients

need not the rest cure, but education, occupation and gradually increased exercise, mental and physical. The business man, on constant strain, who after many years, breaks down, is a distinct type, as opposed to a nervous individual, always dominated by an idea, who receives a shock and from the effect of that develops the neurasthenic state. These two classes are certainly distinct and they should have different treatment.

Dr. WM. G. SPILLER—Neurasthenia may sometimes prove fatal; I have several times seen patients at the point of danger; I think the explanation of nerve exhaustion is applicable to such a condition and I would like to see the nervous system of such a patient examined by the method of Nissl. Within the nerve cells would be found, I think, some change of the chromophilic elements.

Dr. MOYER—My conception of neurasthenia is that of nerve fatigue; if that is not present the condition is not true neurasthenia.

Dr. JONES—The base of neurasthenia is cell-fatigue, and it makes no difference whether in a working man or a society woman. If the nerve cell is in a fairly stable condition, the patient has the neurasthenia described by Dr. Dercum; if he has an unstable nervous system, he has the form described by Dr. Patrick. The real question is as to the stability or instability of the nerve cell.

The complete exhaustion of a center seems to me rather common, although it has been looked upon, perhaps, as other than neurasthenic; but it can be very reasonably explained by the theory of absolute cell exhaustion, the cell being restored under certain conditions and the motor function returning.

Dr. LODER—There are two forms of neurasthenia as widely dissociated as any two diseases of the nervous system. I have yet to see one case of neurasthenia that did not show a very profound hereditary impress. I believe if we put the chromophilic gland under the microscope we will be able to differentiate these cases.

Dr. AUGUSTUS A. ESHNER—Neurasthenia has varied causes. The susceptibility of the individual nerve cell must vary in the same individual under different circumstances. So, too, the designation of "cell tire" must be accepted as exceedingly vague. Perhaps we do not improve upon such a designation if we assume that from excessive or deranged function there result certain metabolic changes, certain alterations in cellular nutrition, which is the essential basis of these varying kinds of neurasthenia or of neurasthenia depending upon a variety of causes. This intoxication, in consequence of the obverse intracellular innutrition, may produce such alterations in neuronic, in ultimate cellular elements, as to give rise to these symptoms which we designate neurasthenia.

While many cases are susceptible to a general line of treatment, the basis of which consists in the re-establishment of internal equilibrium, and into which enter especially the elements of rest, over-feeding and the removal of general psychic disturbances, still the results of therapeutics seem to sustain the view that neurasthenia is dependent upon varied intoxications of the ultimate cellular elements, sometimes cerebral, sometimes spinal, sometimes cerebro-spinal.

Dr. W. J. HERDMAN—For ten years I have been studying neurasthenics with regard to their temperature. I have found it invariably abnormal; almost uniformly raised, but occasionally lowered. As elevations of temperature are known to cause deviations from the normal state of metabolism, this may become, finally, an etiologic factor. Fear is present in some cases as one of the sequelæ of neurasthenia. One patient who had recovered from this disease, suffered from a horror of elevation. It was impossible to make him go higher than the second story of a house. When in elevators it was necessary to restrain his mad impulse to try to jump out.

Dr. CLEAVES—I have found that this sequel of fear has been relieved by Franklinization.

Dr. DERCUM—Neurasthenia is a fatigue neurosis, and all that is not a fatigue neurosis is something else. Possibly it may be an obscure case of interstitial nephritis, in which it is necessary to make repeated search in the urine to find the proof; and you have other cases of pseudo-neurasthenia; the mere fact that they reveal some of the symptoms, though not the true syndrome, does not make them neurasthenia. There are certain persons who are born with a certain predisposition, and under certain strains become neurasthenic; these are the patients who become insane if the strain is prolonged, and who may become paranoiacs in later life.

It is possible to have neurasthenia from physical exertion. A fatal case of neurasthenia was of a college athlete who had overtrained. He broke down and became profoundly neurasthenic. It was a purely physical case; he did not study hard at college, but exercised very severely. He became a terminal neurasthenic, and grew to be like an old man. I could not get an autopsy, but as far as I could tell there was no disease of any one organ.

I have observed slight variations of temperature. It sometimes rises as a result of animal fatigue, and perhaps we have here a hint as to the temperature of neurasthenics being slightly above normal. I believe that fears are a secondary outgrowth. They belong to the secondary symptoms, and I suspect that in those cases in which they are so tenacious, and become a part of the individual, there is some neuropathic strain.

With respect to the pathology of neurasthenia, it seems to me very unfortunate that we have not paid more attention to the remarkable results of Hodge's experiments on the fatigue of nerve cells. Hodge first studied bees from the same hive. Several were penned in the hive; others were on their flight all day carrying honey. He killed one of each at the same hour, took the same ganglion from each and compared them. He always found that the cell from the bee that worked was smaller, and there was a tendency to vacuolation of the general cell contents, while the nucleus stained differently. He tried similar experiments with pigeons, and the cells showed the same changes. He excised the posterior spinal ganglia in cats. To exclude all possible sources of error he would take the same ganglion on the two sides, exciting one by the electric current. There were marked changes in cell substance.

The urine is never normal, and there is always some derangement as regards the uric acid. The excessive nuclear waste would account for the increase of uric acid in these cases.

The protonucleins stimulate these cases, but the amount of good has never been enough to make it an essential part of the treatment. It is probable that such benefit as has been obtained from the Brown-Séquard injections is due to the fact that the elixir contains a very large amount of the protonuclein in its active form.

I have come to the conclusion that strychnia increases the nervousness. I use it only occasionally and in small doses.

Generalized forms of fear get well without any trouble; specialized forms in my experience do not, except sometimes spontaneously. In some way perhaps the tissue metabolism is changed by the Franklinization.

Dr. G. BETTON MASSEY—If neurasthenia is caused by fatigue, you would find it in the Adams expressmen, the trunk lifters and carriers. Nerve cells change under the expenditure of energy, but it is a mistake to attribute those changes as an exactly similar condition in neurasthenia. It seems to me that the fatigue neurosis is a relative one.

MELANCHOLIA AND ITS TREATMENT.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June 1-4, 1897.

BY W. S. WATSON, M.D.

RIVERVIEW SANITARIUM, FISHKILL-ON-HUDSON, N. Y.

The symptoms are despondency, sorrow, fear and despair in degree beyond the natural emotions. Anxiety, grief and fear are peculiar to the normal mind and it is only when they exist to such a degree as to be beyond the power of reason and not in harmony with the laws of logic that we may justly style them morbid or call them delusions. Melancholia, as a rule, does not come on abruptly; on the contrary it is a condition of slow growth, with bodily symptoms of so trivial a nature as to scarcely attract attention; notwithstanding, we believe it is more frequently due to physical conditions than otherwise. Melancholia does not necessarily follow neurasthenia. Observation of cases coming under our treatment strongly incline us to the belief that we should look for toxic causes, autc-toxic substances, poisons created within the body, which, step by step, exert a destructive influence over cell formation, while degenerative changes and insanity follow later. We do not pretend that there are no other than physical causes for mental diseases, or that insanity may not be the product of two or more generations or the outgrowth of arrested evolution, powers destroyed or undergoing changes retrograding; we do know that the various mental diseases

imply pathologic implications of the brain; that the brain is touched, in one way or another, and is no more normal in its functions; that its vascular apparatus, its cells, ganglia, meninges or other bearings are involved directly or reflexly. Admitting as we do that the brain is involved in insanity, that it gives expression, we do not concede that the brain is alone or always primarily at fault in mental disturbances, but rather that the mentality of the individual and all the conditions, both physical and psychical, that make up the impressions and expressions are, in fact, the phenomena of insanity.

The nervous symptoms and mental manifestations arising primarily from auto-intoxication due to retained fecal or urinary constituents do not directly produce the nerve reaction; in other words, nerve reaction can not produce infection, except by making infection possible by weakening the defense which a healthy organism naturally offers to the invasion of microbes, or by modifying nutrition so as to develop a medium favorable to low forms of organisms; a weakened or a disturbed nervous system produces defective nutrition, which in turn opens the inroads of infection. Not only are the inroads opened by disturbed nutrition and nerve action, but there also follows an interference in the distribution of the force, which liberates certain substances elaborated by the different organisms by modifying, augmenting or diminishing the normal proportions; hence myxedema is dependent upon perversion of the functions of the thyroids, as will be shown in our enumeration of cases in the course of this paper.

It may be truly said that within the human organism there exists a constant tendency to toxemia from accumulations, and that intoxication can only be avoided by a perfect performance of functional integrity. In melancholia it is the slight exhibitions or manifestations that are of prime importance. The early recognition of the initial symptoms affords an opportunity to ward off an attack that may later lead to insanity. In the melancholic we meet with the self-conscious, or with a lack of buoyancy and self-reliance; morbid fears are more or less marked, so much so as to be justly called delusions, out of which the individual can not be reasoned. Yet there may be no hallucinations whatever. He is aware of his defective judgment and anxious to rid himself of all, yet try as he may, the tendency is to recall, to revert to that which is troubling him whether there be any real foundation or not. There seems to be a lack of power to fix the mind upon anything else; strength of reasoning is gone, a dislike for association with others, a strong aversion to meet those they otherwise know to be their friends is fixed within them; with many there is a periodic aversion to those most dear to them. Instead of the usual marks of affection there are marked explosions of dislike and hatred, jealousy and suspicion. Jealous without the least provocation, jealous of everybody. If it be a married lady, she criticises every move of her husband, suspects every one of her own sex, imagines that all women want her husband, that every little courtesy shown to other women by her husband is meant as a slight to her. Such feelings dominate her entire nature, and her sufferings in consequence are indescribable; jealousy is a marked symptom in the melancholic, and when possible to trace melancholia to its actual source, a very large per cent. originates in domestic unhappiness, disappointed love and incompatibility. In the management of such cases much depends upon the environments; separation from all that has surrounded the sufferer during the period of development. Nothing so encourages or feeds the morbid feelings or fires up the outbursts of hatred and dislike as being in the presence of the object of that jealousy, or other unnatural feeling. While it is well and proper to cheer and sustain and soothe our patient by words and acts, it is equally necessary to check and reprove by denying certain indulgences. Separation from relations is ofttimes a cure in itself. The sympathizing acts of relatives tend to increase the morbid imagination already in the mind of the melancholic. We can no better express our reasons for believing it all-important to remove the melancholic from his home than to quote the language of Dr. Pinel. It is, he says, "generally so sweet to an invalid to be in the bosom of his family, there to receive the care and consolation of a tender and compassionate affection, that it is with pain I announce a sad truth, one established by repeated experience; namely, the absolute necessity for confiding the mentally disturbed to the hands of strangers and isolating them from their relatives." It is well to bear in mind that not infrequently family differences and domestic discord are closely connected with the origin of the mental disorder. The successful management of the melancholic not only requires separation from friends and home but the help of those trained to assist—a physician and nurse. To the trained or skilled nurse many of the details of treatment are dependent. A properly selected attendant, one possessing a large amount of patience and endurance, full of humanity, intelligent, zealous in his endeavors to carry out the directions of the physician, is invaluable, and no melancholic case has a reasonable chance of recovery without such constant help and attention as can only be afforded them through proper attendance. Attendants have many privations and discomforts to endure in addition to the responsibility accompanying such a position; and if they be conscientious and diligent, deserve words of commendation and appreciation from those in authority. It is the attendant that hourly hears the complaints, and he needs have a ready answer at all times for the poor melancholic, to offer cheer and to lead the perverted mind into brighter fields. Much, indeed, depends upon the tact of the attendant in imparting hope and in leading the patient to believe his disease is a physical one or dependent upon physical causes. A melancholic patient should never be allowed to understand that his disease is one of the mind. Their greatest fear is that they will become insane. A good attendant will never allow an intimation of mental trouble to be made in the hearing of his patient.

Treatment.—Medicinal therapeutics do not offer anything very satisfactory, although much can and must be done to ameliorate the suffering, imaginary and otherwise. Since constipation is an accompaniment and is either due to natural sluggishness or want of attention, we would commence by giving a brisk calomel purge to unload the accumulations and possible cause of auto-intoxication. Frequently the patient brightens up at once and remains so if the condition of the bowels is watched carefully; but if they are allowed to become inactive there will be almost invariably a relapse. So, in regard to the urinary secretions, careful attention is important. A kidney lesion may and often is an important factor in the accumulation of toxic products. The habit

of defecating at a stated time should be encouraged and required. Antiseptics, as salol, naphthalin, etc., are of value and can be used to some advantage for their local antisepsis on the intestinal tract. Insomnia is a feature of great importance and one controlled with difficulty in many cases. If the true cause of worry can be ascertained and removed an important point is gained; if the circulation is slow and extremities cold, static electricity will do more than all else in procuring sleep, by improving the circulation; if the skin is dry and husky, with coldness of the extremities, Turkish baths with the accompanying rubbing and manipulations are indicated; if such means together with judicious counsel by the physician giving moral support in words do not overcome the sleeplessness then drugs will have to be given. Kola, bromids and chloral are about the safest and best. Codeia we use with considerable success in doses ranging from 0.016 to 0.1 gram, it produces rest and sleep by its inhibitory power over nerve irritability. Hyoscin used hypodermically is of all drugs the one that soothes best and lasts longest. We have never seen an untoward symptom follow its use. It must be remembered that hyoscin is one of our most powerful relaxants, a cerebral sedative and hypnotic; especially indicated in melancholic frenzy and motor excitement.

Systematic exercise, occupying the entire time, is of great importance; giving exercise consistent with the patient's physical condition is very important and tends to divert the mind. Walking, riding, playing games, rowing, chest-weight exercise, dumb bells, etc., are excellent. Thyroid feeding reaches some cases. We have been using thyroid almost since it was first suggested or could be obtained. It has, in our experience, proved curative in one instance, which we shall give. At the present time there are diversified views as to its action. It is our opinion that it will be found of value only in the degenerate conditions and myxedematous cases with possible atrophy of the thyroids. There must, at least, be defective functional activity of the thyroids, since it would seem that they secrete something that acts as an antitoxin and in that way counteracts the tendency to intoxication and consequent mental impairment, or there is in the blood of the mentally disturbed a toxin that the normal thyroid is incapable of antagonizing; hence the necessity for supplying thyroid artificially. It is, we think, pretty conclusive that the thyroids supply to the circulation a substance that is required to maintain its proper composition to sustain brain nutrition, or their secretion prevents auto-intoxication by destroying the poisonous products of metabolism. The results of thyroid treatment at Riverview Sanitarium warrants, we believe, the conclusion that thyroid can not be looked upon as a remedy for mental disease or that it may be generally used in all cases; on the contrary, it is applicable in cretinism and mental degeneracy of insanity. Myxedema is comparatively a new disease, attention having been called to it only about twenty-six years ago, and is primarily a bodily disease. Mental impairment follows after a time. We had great hopes after reading the report of Dr. T. S. Clauston, medical superintendent of the Royal Edinburgh Asylum, in 1892, on the use of thyroid, that a means had been discovered that would reach a large per cent. of insanity cases. Later reports together with our own experience even in mild mental cases, show that our hopes were placed too high. It is, however, certain that thyroid extract is a therapeutic agent of value in selected cases and that cell changes are affected by it in a remarkable manner; the quickened circulation undoubtedly increases metabolism.

Case 1.—Miss A., age 28 years, admitted March 28, 1896; weight 185 pounds, German descent, American born; showed mental disturbance three years previous but seemed to recover, relapsed May, 1896; when admitted was at times erratic, at others stuporous; slow in decision; strong erotic feelings; myxedematous appearance. Thyroid was given in 0.32 gram doses, t. i. d., for a period of ten days; patient's circulation or pulse rate was increased with complaint of fulness in the head, palpitation, fibrillary twitching of hands, crawling sensations with increased erotic feeling. It was thought best to discontinue the remedy, as there was a general aggravation of the symptoms.

Case 2.—Mrs. R., age 46 years, had been an inmate of an asylum eighteen years previous, during her puerperal state, since which time had remained well. When admitted showed decided nervous symptoms, insomnia, meaningless laughter and extreme restlessness with outbursts of religious excitement. Thyroid was given in 0.32 gram doses the first three days and increased to 0.65 gram, t. i. d., with steady increase of insane symptoms; at the end of third week it was necessary to remove her to an insane asylum.

Case 3.—Miss P., age 33 years; admitted Oct. 12, 1896; had been ill over a year; whole disposition had changed from an active worker and unassuming maiden lady to the belief that she belonged to some man or ought to, showing marked erotism in various ways, whole mind seemed to be upon man, how this or that one could save her, etc. Thyroid was given in increasing doses, beginning with 0.32 gram, t. i. d., believing the extract might be indicated from the degenerate tendency of the mind; after the doses had been increased to 1 gram, t. i. d., the erotism had so increased as to make it necessary to watch the patient every moment, lest she, in her uncontrollable condition, would make a show of herself; every expression and movement as well as words showed intense sexual excitement; the thyroid was discontinued. Hyoscin and codeia was given in moderate doses and in five days the undue sexual feeling was gone. The patient remained under our observation and treatment for a period of three months, when she had recovered to such an extent as to be sent to her friends cured.

Case 4.—Miss A., again on thyroid, Dec. 18, 1896. She is of a neuropathic family, the history is, that an older brother had Basedow's disease at one time in life; at the age of 24 the patient received a shock that seemed to produce a condition of uncertainty and confusion of mind which unfitted her for her work, that of a typewriter and stenographer. For some months she continued to show nervous conditions and mental impairment, at times talked of others having an influence over her and that her thoughts were not her own. She was never truly insane nor so declared, neither was there any necessity for any special restraint; never suicidal or homicidal; sometimes excited, at others depressed, but never to a very unpleasant or unreasonable degree; in such a state she continued for a period of about two years. As time went on she showed signs, in various ways, of increasing erotism, delighting in relating her experience with men and her ideas of man and his relations to women, marriage relations, etc., often expressing the belief that marriage would be a cure for her; physically she presented no marked myxedematous appearance, at least there were no well-defined symptoms of myxedema; there was a strong tendency to increase weight, face was lardaceous and pasty, hands somewhat clubbed and finger strutted, skin greasy. Thyroid was given in increasing doses, commencing with 0.32 gram doses, t. i. d.; after the fifth day the doses were 0.65 gram three times a day; at the end of four weeks she was taking 4 grams per day, at which time the improvement was so marked in every respect that she was declared well by one of the leading neurologists of the country; the erotism had all disappeared, she was again the modest girl of former days, improved in every direction; yet we looked upon the case with some degree of suspicion, fearing that by the withdrawal of the drug she might have recurrent symptoms; the state of high tension in the circulation had been kept up for a number of weeks, pulse ranging from 90 to 120 a large part of the time, with but little elevation of temperature or other looked-for attendant symptoms while under the thyroid treatment; the urine presented nothing abnormal at any time; some nausea at times and one diarrheal attack during the first six days; under advice it was thought best to gradually withdraw the thyroid and let the circulation come down to its normal rate. The thyroid being reduced to a minimum amount, 0.32 gram per day, close observation was kept over the patient and after

she had been on the minimum amount five days, recurrent symptoms came on; she became disturbed and erratic and a complete relapse followed. After watching the symptoms a few days the thyroid treatment was returned to and given in increasing doses; no apparent change was noticeable until 3 grams per day were given. After the second week the maximum amount of 4 grams daily was given. Decided improvement followed and after being on the full doses one week and a half she showed none of her unnatural symptoms or feelings; in both instances the improvement under the thyroid treatment has been striking and progressive. There can be no doubt as to the cause of the change. We now believe it will be necessary to continue the thyroid treatment for an indefinite time and that her thyroids are defective in supplying a needed element.

While we have not seen such changes as Dr. Clauston of Edinburgh, Dr. C. K. Clark of Kingston, Ont., Dr. Chas. G. Hill of Mt. Hope Retreat, Baltimore, we do believe the thyroid should be tried even though myxedematous appearances are not apparent.

DISCUSSION.

Dr. CANFIELD—My experience with hyoscin in insomnia and melancholia has been very unsatisfactory and I have recently given it a very thorough trial. In one case, the insomnia seemed to vary more than with the dose of trional which I had advised, finding at the beginning that hyoscin was not powerful enough in itself to give any satisfactory sleep. I have found in some other cases that it is more uncertain than almost anything I know of as a hypnotic. Has Dr. Watson found any kind of diet efficient in these cases? I could get no satisfactory results along these lines.

Dr. WATSON—I have not found any line of diet that is worth mentioning as being reliable.

Dr. C. H. HUGHES—When hyoscyamus was first introduced into practice Merck sent me the amorphous hyoscyamus. I tried it to my entire satisfaction. After leaving the asylum I tried it considerably. I recollect a case that began with acute mania, in which the immediate effect was magical, after the ordinary doses of chloral hydrate had failed. I think the result was to prolong that and other cases. I began the use of hyoscyamus about 1872. It seemed not to do the case any good except to produce sleep. In a case of maniacal excitement there is nothing like hyoscyamus. In treating melancholia I always give codeia, in doses adequate to make an impression on the patient and change his psychic feelings; then I withdraw it. It is surprising how small a dose of codeia will suffice in many cases. Less than 0.065 gram is not effective, but 0.13 gram of codeia, combined with aloin given three times or twice a day, after the morning and midday meals, is generally sufficient.

Dr. KINDRED—I would favor hyoscin in preference to the other related alkaloid. I have found, as a point of difference in the histologic action of the two, that while hyoscyamus gives a most distinct action as a motor sedative, it does not cause sleep so surely as hyoscin. Hyoscin, in my experience, has acted much more happily than in that of Dr. Canfield. I usually expect to secure from six to eight hours' sleep from a full dose, which I would call $\frac{1}{150}$ grain (0.0015 gram) usually, or, if there be any idiosyncrasy or any danger from giving so much, a dose of $\frac{1}{100}$ grain (0.0007 gram). With regard to diet in melancholia, I would refer to the method employed by Professor Clauston, which he calls over-feeding. It is only a system of filling the economy with albuminous material. He uses pure milk and egg, sometimes combined with vegetable food in the form of liquid extract. He gives from a pint to a quart of this albuminous mixture, every three or four hours. That, I believe, has the advantage which he claims of building up the nutrition as rapidly as possible, as is necessary in melancholia, which is the result of mal-nutrition. But it has the further advantage of leaving as little residuum and debris in the intestinal canal as possible. Since, as Dr. Watson claims, this condition may even result from auto-intoxication, that is an important point in treating melancholia.

In reply to a query Dr. Hughes stated that he did not use hyoscin to the exclusion of chloral hydrate or some form of bromid, preferably bromid of sodium. He would not rely on hyoscin except as a pure hypnotic to coerce sleep in cases in which the necessity for bringing about sleep immediately is imperative. He did not use hyoscyamus at all.

Dr. WATSON—In regard to the use of bromid of sodium in such doses as 4 grams or more, I very frequently find that my patient seems to be more depressed afterward, while the less frequent doses of hyoscin seem to have a less disastrous effect. Bromid in combination with strong bitter tonics may sometimes be safely used.

RUMINATION IN MAN.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-eighth Annual Meeting of the American Medical Association, at Philadelphia, Pa., June, 1-4, 1897.

BY WHARTON SINKLER, M.D.
PHILADELPHIA, PA.

Merycism, or rumination in man, although described by ancient medical writers, has attracted but little attention until within the past few years. Hammond, who reported a case in 1894, said that only about fifty cases had been recorded up to that time. Since then, however, a number of additional cases have been recorded, both in this country and abroad. I have however been able to find only thirteen reported in America, but in Europe a great number of cases have been added to the literature in recent years. The American cases are:

Hubbard: *Medical Record*, 1886, p. 122, one case.
Max Einhorn: *Medical Record*, 1890, p. 38, two cases.
Charles Shattinger: *Medical Fortnightly*, 1892, p. 163, one case.
W. A. Hammond: Proceedings of American Neurological Association, 1894, one case.
D. W. Graham: *Chicago Medical Examiner*, 1894, Vol. xv, p. 118, one case.
Edward Runge: *St. Louis Med. Review*, 1894, p. 121, one case.
Edward Runge: *Boston Med. and Surg. Journal*, 1895, Vol. cxxxii, p. 575, three cases.
Albert Abrahams: *Medical News*, 1895, p. 405, one case.
David Riesman: *Journ. of Nervous and Mental Diseases*, 1895, two cases.

It is probable that a great number of mericoles exist whose cases have not been reported, being regarded by their physicians as cases of ordinary indigestion with vomiting. It is also likely that many persons who have the habit of regurgitation of their food are withheld from saying anything about it, either because they do not think it worth while to consult a physician, or because they are ashamed to speak of it. Brown-Séquard and Blanchard were mericoles, and the latter has written a treatise on rumination.

The disorder was described very fully by the great Italian anatomist, Fabricius ab Aquapendente, in 1687. He seems, however, to have been somewhat tainted with superstition in regard to the subject, for he describes two cases of merycismus, one of which was a nobleman alleged to have two horns on his forehead, and the other was a monk whose father had a little horn on the forehead (Lemoin and Linossier, *Rev. de Méd.*, 1894, p. 177). Pipelet wrote the first really scientific paper on the subject, in 1786.

Rumination or merycism must not be regarded as the simple regurgitation or vomiting of food. It is a return of the food shortly after it has been swallowed, unattended by nausea, retching or disgust. In many cases only the portions of food which need remastication are returned. The regurgitated food is either rejected from the mouth, or it is remasticated and again swallowed. The act of rumination in man is analogous to the process of rumination or chewing the cud in certain of the lower animals. This act in the herbivorous animal is probably the result of evolution. Blanchard (on rumination, "Handbook of the Medical Sciences," Vol. VIII) says that "the habit of rumination was acquired by certain animals at the time that the carnivora first appeared upon the earth. Fearful of attack, the ruminants grazed rapidly, ready for flight at the first intimation of danger; then, having reached a place of safety, their food was regurgitated and masticated thoroughly." "A similar condition"

he asserts, "is obtaining in man in this age of hurry, and unless we learn to be more deliberate in our eating, and masticate our food in the first instance more carefully, the interests of digestion will compel the regurgitation and re-chewing of the food which has been so imperfectly prepared for the action upon it of the gastric and intestinal secretions, and in time this process, which is now exceptional in man, will become habitual." This, we hope, is a fanciful idea on the part of the writer. Man will first have to acquire a digestive organ similar to that of the ruminants before he can begin the same process of digestion as they have. In the young of the ruminants, the stomach is a simple organ consisting entirely of the abomasum or rennet. As the animal grows older and begins to eat grass, the stomach becomes divided into other compartments, and in adult life the stomach is a large and complicated organ, consisting of four distinct compartments—the rumen or paunch, the reticulum or honey-comb bag, the psalter and the abomasum or rennet. The food, after its first imperfect mastication, passes into the first and second stomachs. After a short time, dependent upon circumstances, the food is regurgitated into the mouth where it is remasticated and then swallowed in a state of fine subdivision which permits it to pass through the narrow aperture between the reticulum and the psalter. Then the food passes into the abomasum or true stomach, and is there subjected to the action of the digestive juices. In the act of regurgitation two factors are present, one the lessening of the intra-thoracic pressure, and the other the aspiration of the gastric contents. The stomach itself is probably a passive agent in the act of regurgitation, as it is in the act of vomiting. There is, however, an anti-peristaltic movement in the esophagus as soon as the bolus enters this canal.

Rumination is a reflex act and is controlled by a center in the medulla oblongata. The nerves concerned are the pneumogastric, the phrenic, and the motor nerves of the abdomen, stomach and the esophagus. The process of rumination in man has been carefully studied by several writers, and is regarded by all as being practically identical in its mechanism with that of the herbivora; "the factor of paramount importance being the closure of the glottis and the descent of the diaphragm, but while the mode of its production has been quite fully elucidated, we are still ignorant of its ultimate cause."[1]

No constant anatomic lesions have been noted. The lower end of the esophagus has been found dilated in one or two cases, but this has not always been observed and, on the other hand, a dilatation of the cardiac end of the esophagus has been found in cases that did not present rumination.

The causes of rumination have been variously assigned by different writers, but the majority of observers agree that in nearly all cases of merycismus there is a neurotic diathesis, and that neurasthenia plays a large part in the production of the affection. Lemoin and Linossier (op. cit.), who have collected a number of cases, believe that the majority of mericoles are neurasthenic. These authors explain the process as a means of correcting acidity, the salivary juices diminishing it in each act of reswallowing. Singer ("xxx," *Deutsches Archiv für Klin. Med.*, 1893, No. 1, p. 503), in an elaborate article on the subject of rumination, gives the following conclusions: "1, rumination and regurgitation ought to be identical with each other; 2, rumination is the expression of a nervous constitution; 3, the next reason for the condition is the relative insufficiency of the cardia; 4, the mechanism consists of an aspiration of the stomach contents into the relaxed cardia by reason of the ramification of the air in the thorax, occasioned by a simultaneous expiratory act of the closure of the glottis; 5, the regurgitation of the food can be prevented by expiratory acts; 6, the *antrum cardiacum* corresponds to a widening of the esophagus, demonstrable in life; it occurs from stretching, by swallowing large pieces of food; 7, rumination is to be differentiated physiologically and clinically from vomiting; the only form that it can be allied to is nervous vomiting; 8, the relation of the function of the stomach is constant, and has the complex symptom of rumination in all the significance of an accidental occurrence; 9, regurgitation in diverticular formation and in dilatation of the esophagus is different from rumination in the predominance of difficulty in swallowing; 10, hasty eating and much fluid drink must be avoided; medication should be directed to tone up the cardia."

My own experience, and that of the writers above quoted, lead me to believe that in the great majority of cases rumination is dependent on a condition of either neurasthenia or hysteria and that it rarely occurs in healthy persons, although this may be the case. Heredity undoubtedly plays a part in the causation of the disease and this may be indirectly through a neurotic diathesis, or the disease may be directly transmitted as in the case recorded by Runge, (*Boston Med. and Surg. Jour.*, 1895, p. 515). In this instance a father, son and son's son were all mericoles. In a case reported by Lemoin and Linossier the patient had a brother who had the habit of merycism. Two varieties of rumination are observed; one which depends upon a previous condition of gastric indigestion and the other which is simply a habit or it may be the expression of a neurasthenic condition. In other words, there is a digestive and a neuropathic merycism. In most mericoles the process is perfectly natural and if this is interfered with they suffer some discomfort or some stomach disarrangement occurs. A German physician, Nacke (quoted by Riesmann), who is a sufferer from this affection and who has studied his own case carefully, is convinced of its relation to neurasthenia, for he found that whenever the nervous system was most unstable the rumination was most energetic. Singer (*op. cit.*) says, that the act of rumination is prevented by sexual excitement. Runge (*St. Louis Medical Review*, Aug, 18, 1894) has reported an interesting case of rumination and has advanced a very ingenious theory as to atavism as a cause of merycism. The arguments which he advances are the development of the stomach by the laws of natural selection by which the conditions of the animal are adapted to the environments. We can scarcely accept this theory, as the connection between man and the ruminant with his four stomachs is too remote. The manner of eating and the character of the food eaten has, no doubt, much to do with the production of rumination in persons predisposed to nervous disorders. Hasty eating and imperfect chewing and drinking much liquid with meals is a frequent cause. Rumination may be the result of imitation, as seen in the case of two children reported by Koerner (*Deutsches Archiv für Klin. Med.*, Bd. xxxii, p. 554). Their governess was in the habit of regurgitating her food and the chil-

[1] Riesman: Journal of Nervous and Mental Disease, June, 1895.

dren copied the practice; they were cured when the governess was sent away.

The symptoms of rumination are very constant. As a rule, at a period varying from a half hour to an hour after a meal, the patient begins to have a return of the food into the mouth. This occurs without any discomfort or nausea and generally without gas. The patient is usually unaware that regurgitation is about to take place. The food tastes pleasant and the patient usually swallows it again immediately, or if there be any large particles of food which have been imperfectly masticated, rechews and swallows them. Most patients declare that the different articles of food can be tasted and discriminated from each other. A patient, whose case is related by Riesman, said that when he drank beer it was returned and tasted more pleasantly than it did at first. Other writers have found that mericoles assert that the food tastes pleasanter when regurgitated. The period of rumination lasts from a half hour to two hours and then ceases. At times a condition of hyperacidity of the gastric contents is found, but a large number of examinations made by different writers show that there is no constancy in regard to this condition. In dyspeptic rumination the food which is rejected may have a sour and disagreeable taste.

The following cases of rumination have come under my own observation:

Case 1.—Robert G., aged 20 years, waiter, referred by Dr. Thomas C. Potter. The family history of the patient was practically negative with the exception of neurasthenia in a sister. There is no knowledge of nervous disease or of the disease from which the patient suffers. In his childhood he had measles, urticaria and subject to rheumatism. Syphilis is denied and he says that his habits are good regarding alcohol and tobacco. He applied at the Orthopedic Hospital and Infirmary for Nervous Diseases, September, 1896, for the relief of nervousness, insomnia, general trembling and indigestion. The extreme nervousness was of recent date, but the indigestion was of ten years duration. It was found upon inquiry that since the age of 10 years he had been in the habit of regurgitating his food soon after it had been taken. The regurgitation began at various periods after eating; often immediately after a meal and never later than a half hour after. The act occurred irregularly at first, but soon became a constant occurrence. The intervals have varied, and lasted from three to nine hours after eating, though usually the period was from two to three hours. The food is agreeable in taste at first, but toward the latter part of the period of regurgitation becomes disagreeable and the patient has some discomfort of digestion. The amount regurgitated usually fills the mouth. While in a recumbent position there is usually some abatement in the symptoms, but it is never entirely prevented. It never occurs during sleep, but may continue for a half hour after he has gone to bed. If he makes an effort to restrain the act there is pain in the epigastrium. The food often fills the mouth before he is aware of regurgitation, but there are times in which it may be felt rising from the stomach through the esophagus. If rejected from the mouth the food is found to be in a mushy or semi-liquid state and if allowed to settle forms two layers; a liquid layer below and a white curdy layer above. Milk is returned curdled but not sour. He asserts that he has always been discreet in his diet, chewing his food thoroughly before and since the onset of the disorder, and he can give no explanation as to its development. An examination of the patient shows a generally neurasthenic state. He has the usual subjective sensations of the condition, such as a sense of bulging of the temples, pressure and pain at the nape of the neck and heaviness about the eyes. He is very nervous and exhibits a general tremor when excited. Knee jerks are active but not spastic and there is pseudo clonus of the left ankle. Pupils are normal; there is no motor paralysis or sensory change. The heart and lungs are normal; the appetite is poor; the bowels constipated and the tongue is coated. An examination of the epigastric and hypochondriac regions disclosed no abnormality in the area of stomach tympany.

Case 2.—Harry B., aged 39 years, works in a butcher shop, married. Applied for treatment Nov. 12, 1894. Has had good health until somewhat more than a year ago, when he began to suffer from severe frontal and temporal headaches. These headaches answered the description of migraine and occurred after excessive use of the eyes or exposure to unusual excitement. His family history is negative as is also the personal history previous to the present trouble. He has been temperate in his habits and has had no serious illness. For a year he has had regurgitation of food, especially after taking any indigestible substances. The food is returned almost immediately after eating and is not disagreeable to the taste. It is usually swallowed without being rechewed. The patient has more or less indigestion and a sense of epigastric discomfort after eating. The condition on examination is as follows: General nutrition fair; tongue coated, flabby, glossy, and is tremulous on protrusion. The patient is in a general neurasthenic condition. He complains of fulness in the head; has a poor memory and the eyelids are tremulous. The attacks of headache occur about once a week. The eyes were found to be astigmatic. The reflexes were normal and the urine showed no sign of kidney disease. The act of regurgitation occurs now after almost every meal. The patient was treated with cannabis indica and regimen directed to the relief of his neurasthenic condition. The regurgitation was entirely relieved and had not reappeared when the patient was last seen after an interval of about six months

The two following cases are not instances of typic rumination because the food is not reswallowed after regurgitation from the stomach, but the process is allied to that of mercyism.

Case 3.—Mary W., aged 5 years, was brought to the Orthopedic Hospital and Infirmary for Nervous Diseases March 18, 1895, with the statement that she had vomited every meal immediately after eating. The food was returned within about ten minutes after its ingestion; there was never any nausea and the food was but little changed in appearance; it was never remasticated nor reswallowed. There was nothing of note in the family history except than a maternal cousin was an epileptic. The patient was born at term without complications; speech was developed normally; she walked early and the teeth were cut in good time. Except an attack of measles and whooping cough at about 4 years of age, the patient has had no ill health. The patient's condition was as follows: Her general nutrition was fairly good; face flushed; appetite good; slept well; no headache; knee jerks were normal; heart and lungs normal; patient's mental state was slightly below par.

Case 4.—Miss G., aged 30 years, has for years been exceedingly neurotic and hysteric. Her mother is nervous and at least one of her sisters is of a highly nervous temperament. For years she has been eccentric in her eating and has refused to take food, except in the smallest amounts, for periods of several months, so that she has at times become emaciated to the last degree. She has been in the habit of taking champagne, to the amount of about a pint a day, for the past two or three years and for several months has taken chloral to induce sleep. She is irritable and exceedingly perverse. She has been in the habit for some years of regurgitating her food immediately after it is eaten. The food is brought up in large quantities, more by an act of vomiting than true regurgitation, but the act is performed without nausea or effort. The food is not disagreeable in taste or odor. There are intervals when the patient retains her food, but it depends rather more upon inclination than otherwise.

Prognosis.—The prospect of recovery in rumination is not good and this would naturally be inferred from the nature of the affection. Many cases improve to a great extent under appropriate treatment and often with no treatment there are intermissions of one to three years, but sooner or later there is a return of the habit. In many cases patients voluntarily return to the practice of rumination, either because they like to retaste the food or the regurgitation of the food relieves some gastric distress.

Treatment.—This consists mainly in attention to the general health of the patient. There is generally a neurasthenic condition and this should be relieved if possible by an appropriate line of management. In many cases the habit of rumination will be arrested as long as the patient's general health is up to standard and there a is a return of the trouble as soon as

there is any failure in the general health or recurrence of the neurasthenia.

In one of the cases which I have reported the rumination ceased when the patient's general health had improved and did not return as long as he was under observation, although the attacks of migraine, for which he had originally come for treatment, persisted. There are practically no therapeutic measures of use in these cases, with the exception possibly of nerve sedatives and tonics. If there is gastric indigestion this must be corrected. Lavage is an important procedure in the management of cases of rumination dependent upon indigestion. The diet should be carefully regulated, and what is of great importance, the amount of liquid taken with a meal should be reduced to a minimum. Thorough and complete mastication of the food is also an essential matter in this disease. The patient should be trained to control the inclination to regurgitation of the food. Hypnotic suggestion will probably prove useful in the management of such cases, although I have seen no record of any treatment by this measure. Hammond stated that the patient whose case he reported before the American Neurological Association was mentally defective, and with a view of relieving the psychical condition he trephined the skull, first in one parietal region and then in the other. The merycism ceased after the first operation and had not returned at the time that the case was reported. In this instance, no doubt, the checking of rumination was due to suggestion.

DISCUSSION.

Dr. JAMES HENDRIE LLOYD—This would seem to be a neurotic state allied to the condition of hysteric vomiting. I do not think in hysteric vomiting it is common to have true rumination, and there is constant attempt at retching—probably more a condition of esophagismus, a tendency to regurgitate through the esophagus. In an idiotic child that came under my observation there was regurgitation from the mouth, the food being disgorged, reintroduced into the mouth and eaten over again. The procedure resorted to in the case reported by Dr. Hammond seems hardly worthy of being followed. The treatment is by suggestion, and we can get ideas into people's skulls without making holes to put them in!

Dr. CHARLES H. HUGHES—I think the better treatment is by digestion rather than suggestion. I have been accustomed to associate the majority of these cases with conditions of dyspepsia in persons of neuropathic diathesis. I have seen these cases in neurasthenia. When I first read Trousseau on "Apepsia Nervosa," and subsequently gained a great deal of experience with nervous dyspeptics, I found that there were many of these conditions in which regurgitation took place and in some instances the food was rechewed.

Dr. SINKLER—I think the point is that rumination is not a condition of indigestion; the food when returned is sweet and pleasant. As soon as it becomes fit for intestinal absorption it passes out of the stomach and ceases to be returned to the mouth. Dr. Lloyd's remarks remind me that several cases of rumination have been reported in idiots. There is one suggestion that can be made in regard to this habit, that it is a form of digestive perversion like sexual perversion. I think a lack of thorough mastication is probably one of the primary causes.

A CLINICAL AND PATHOLOGIC REPORT OF A CASE OF PROGRESSIVE DEMENTIA.[1]

Presented in the Section on Neurology and Medical Jurisprudence, at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, June 1-4, 1897.

BY CHARLES K. MILLS, M.D., AND MARY A. SCHIVELY, M.D.

PHILADELPHIA, PA.

The case under consideration presents the following history:

Patient aged 64 years; married; has had five children, three of whom are living and in good health. She was always of a nervous, somewhat irritable, temperament, but mentally bright and clever, with linguistic and other accomplishments. After the birth of her first child she had an attack of mania; when about 23 years of age she had an attack of chorea which lasted several weeks. At 35 years of age, apparently as the result of unusual worriment owing to sickness, she became more irritable and her temper was afterward capricious. For about ten years previous to her death she was subject to spells of excitement which almost amounted to transient derangement, but she had no tangible delusions, although she had a tendency to persecutory ideas, frequently believing without cause that she was abused and ill-treated by others. During the same period she began to show a decided amnesia for names, this gradually but surely increasing, so that for several years before her death it was almost impossible for her to recall the names of acquaintances, and occasionally of objects with which she was familiar. She had, however, no motor aphasia and could converse and write well, having an unusual facility for letter writing until within three years of her death.

FIG. 1.—Long pyramidal cells, showing moniliform swellings of basilar and apical dendrites. Region of second frontal convolution.

Up to this time she had been less vigorous, but always attended to her business affairs, kept house and performed what other duties she had to do. During this third year previous to death she became so unreasonable that it was impossible to live peaceably with her, she having at times outbursts of uncontrolable passion. General failure of memory was first noticed about two years before death, during which time she became half bedridden.

In January, 1895, she had what appeared to be an attack of grippe; there was rise of temperature and she complained of intense pain in the right side of the head, also of pain in the back, extending down the legs in the course of the sciatic nerve. This attack lasted about a week and she apparently regained her usual health. In March of the same year she had a second attack, which was also accompanied by intense backache and pain in the head, the latter pain being persistent and always referred to the right parietal region. The patient did not improve as she

[1] An abstract of a portion of this paper, with other illustrations, has been published as a "Preliminary Report," in the Proceedings of the American Medico-Psychological Association for 1897.

had done after the previous attack, except that the lumbar pain diminished. There was marked insomnia.

After two or three weeks she began to have marked delusions, which related to her surroundings and also to her children. She believed that she had been taken away from home and was living in a strange house. She spoke of having visits from her father and mother, both of whom had been dead for many years. Sleep was only obtained by the use of hypnotics.

In April, 1895, a consultation was held by Drs. Sinkler and Mills. At this time the patient had marked delusions, talked volubly and at random; was unable to walk without assistance and if she attempted to do so staggered, always pitching to one side.

During the last eighteen months of her life she was confined to bed continuously. Her chief symptoms during this time were vertiginous attacks; difficulty in orientating; marked amnesia, not only for names but for recent events. She gradually became feebler mentally and a few months before her death was in a state of decided dementia, with occasional periods of excitement. Her attempts at conversation were childish and incoherent; she had numerous unsystematized delusions; she failed to recognize her children and attendants and lost memory of everything.

FIG. 2.—Long pyramidal cell from the second frontal convolution, showing roughening and swelling of the apical dendrite; deformity and loss of basilar dendrites; absence of gemmulæ.

An ophthalmoscopic examination made in April, 1895, and again in the early part of 1896, revealed no change in the fundus. One pupil was dilated. There were no bed sores, and no paralysis at any time.

November 5, 1896, she became suddenly comatose and died the next day. The case was one in which the entire fabric of the mind seemed gradually to break up, and step by step with failure of physical powers mental failure progressed.

The postmortem examination made by Drs. Burr and Kelly, November 7, revealed the following pathologic conditions: The dura was somewhat thickened; the pia-arachnoid opaque. The internal carotid, posterior communicans and basilar arteries were atheromatous; the left anterior communicans showed aneurysmal dilatation. Miliary aneurysms of the pial vessels were present on the ventral surface of the pons. Portions from six regions of the cortex were hardened in alcohol, the remainder of the brain was placed in Müller's fluid.

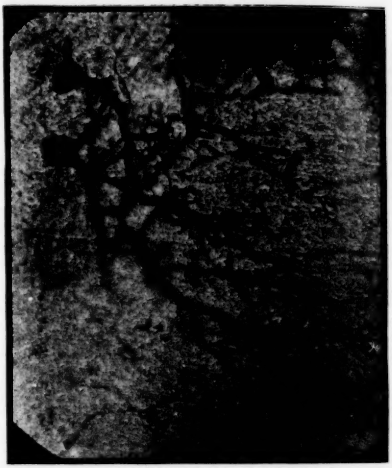

FIG. 3.—Purkinje cells of cerebellum, showing atrophy of the dendrites; stumpy branches in place of feathery dendrites.

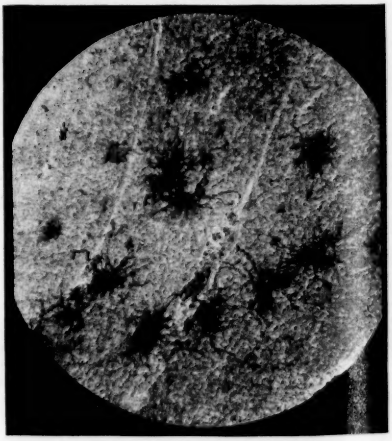

FIG. 4.—Protoplasmic glia cells from middle occipital region; some presenting a botryoidal appearance, others showing stages of disintegration.

The methods employed in the microscopic examination of the brain were the following: The silver phospho-molybdate method of Berkley; Nissl's methylene blue; thionin according to Lenhossek; Weigert Pal; eosin and hematoxylin; also hematoxylin, picric acid and fuchsin. (Van Gieson.)

Microscopic examination reveals the following pathologic conditions:

The neuron shows internal changes which consist in deeper staining of the cell body; the chromophilic particles are irregularly arranged; absent from some areas and aggregated in others, giving the protoplasm a vacuolated appearance. In most cases the chromophilic particles are arranged as a layer of fine dust around the nucleus, next there is a surrounding clear space and beyond this a layer, either continuous or interrupted, of chromophilic particles along the cell wall. The chromophilic particles of the cell processes are either wanting or sparsely scattered throughout. The nucleus is regular in contour; the larger chromophilic particles are absent, while the finer dust-like particles and normally clear karyoplasm stain irregularly. The nucleolus is somewhat increased in size and shows a markedly increased receptivity to stain.

External changes in the neuron are shown in roughening deformity and in some cases excavation of the cell-corpus. The basilar dendrites show moniliform swellings along their course, or are shortened, with

Fig. 5.—Section in region of second temporal convolution, showing thickening of the pia-arachnoid, stasis and over-distension of cortical vessels.

clubbed extremities, or some of the dendrites are absent. The apical dendrite is roughened and irregular in contour. The fine collaterals and terminals are wrinkled and irregular in contour. Gemmulæ are absent in the regions of moniliform swellings of the dendrites and at other points. The long pyramidal cells seem to be most affected, although similar changes do occur in the fusiform and polymorphic cells they are not so marked. These changes of the neuron are not limited to any special region of the cortex. The Purkinje cells of the cerebellum show thickened stems with short stumpy branches in place of the feathery dendrites of the normal cell.

The basilar and internal carotid arteries show an increase in the number of endothelial cells and a growth of new connective tissue derived from the endothelium. This growth consists of branching cells, proliferated nuclei and basement substance, the latter being very dense. Scattered through this new growth are areas of atheromatous degeneration. The elastic lamina is intact. Both vessels contain thrombi.

The left posterior communicans is twice the diameter of the right. In both, the intima, media and adventitia are equally thickened, and thrombi are present.

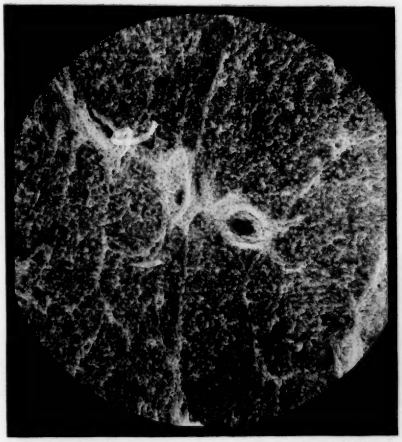

Fig. 6.—Section of the right optic nerve, showing similar changes to those found in the cortical vessels.

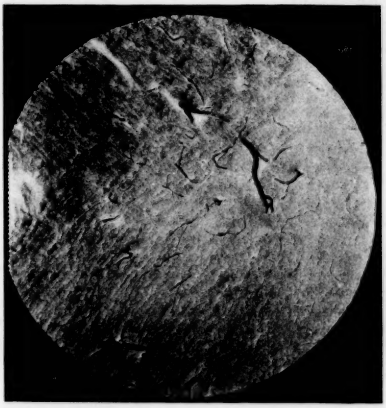

Fig. 7.—Section of optic chiasm; similar vascular changes.

The anterior communicans exhibits aneurysmal dilation; the endothelium is absent; there is proliferation of adventitial elements with increase in basement substance, the latter being so marked as to give the whole vessel wall a hyaline appearance. There are areas of atheromatous degeneration in this increased basement substance; the elastic lamina is absent. The vessel wall opposite to this thickened area shows

absence of the media and thinning of the adventitia. The vessel contains recent and partially organized thrombi.

The pia is increased in thickness shows nuclear proliferation and evidences of extravasated blood in the form of groups of corpuscles and hematoidin crystals. The pial vessels show thickening of their walls and stasis; they are markedly tortuous and present aneurysmsal dilatations in their course. Miliary aneurysms found on the ventral surface of the pons have the appearance of grape-like clusters. On section the walls of these vessels show nuclear proliferation of the protoplasmic cells of the adventitia, also extravasation of blood corpuscles and pigment into the spaces between individual vessels. Stasis and over-distension is marked.

The cortical vessels of all sizes are over-distended with blood corpuscles; they are exceedingly irregular and tortuous in their course (many being twisted several times upon themselves); they appear much more numerous than normal. The perivascular lymphatics are distended, showing wide spaces between the vessel sheath and the brain substance. The pericellular lymph spaces are also enlarged.

FIG. 8.—Transverse section of vessels of anterior perforated space, showing stasis, thickening of their walls and distension of the perivascular lymphatic space.

The protoplasmic glia cells present a series of transitional changes; their fine mossy granulation appearance is lost; the pseudopodia show varicose swellings in their course, thus far they retain their vascular attachment. Many cells show an irregular botryoidal appearance and loss of vascular attachment. Finally, evidences of disintegration of cells is to be observed. Deiter's cells are numerous both in cerebrum and cerebellum.

Areas of softening occur in right ascending parietal region, they consist of a reticulated stroma surrounding a central cavity which contains portions of blood vessels; groups of blood corpuscles, hematoidin crystals and fragments of nerve and neuroglia tissue. Areas of coagulation necrosis are present in the left ascending parietal region.

Medullated fibers show different stages of myelin degeneration; these appearances are demonstrable in the ascending parietal region, the optic chiasm and in irregularly scattered areas of the pons and medulla.

The pathologic conditions occurring in this case of progressive dementia may be summarized as follows; 1, internal and external changes of the neuron; 2, changes involving the cortical and pial vessels, also the vessels of the base of the brain; 3, changes in the protoplasmic glia cells; 4, multiple areas of softening in the ascending parietal region; 5, myelin degeneration.

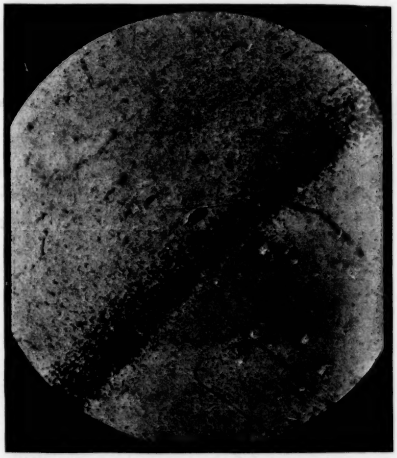

FIG. 9.—Section of cerebellum, showing over-distension and multiplication of vessels.

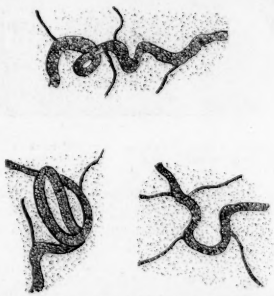

FIG. 10.—Tortuous vessels from the ascending parietal region.

The above described changes in the neuron correspond to those found by Berkley in experimentation upon alcohol poisoning, and in examination of cases of alcoholic dementia. They also correspond to the changes described by Andriezen as occurring in alcoholic dementia and other insanities. A survey of the views of these authors upon the pathology of insanity is therefore in order.

Berkley considers that conduction of the nerve stimuli to the cell corpus takes place principally through the medium of the gemmulæ, and that these are the

first division of the neuron to atrophy. If the gemmulæ lose their vitality or become diseased conduction of impulses is impossible. Inco-ordination of thought and motion would then result from loss of direction as well as from want of originative impulses. Permanent dementia would be the result of the degenerative process involving a large number of cortical neurons.

FIG. 11.—Section of atheromatous portion of the basilar artery.

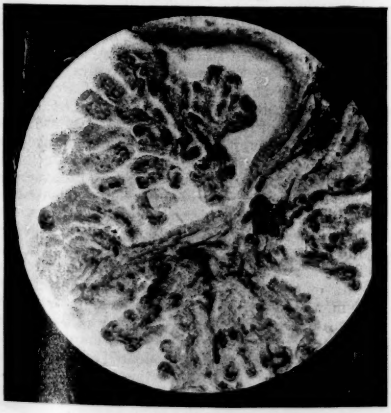

FIG. 12.—Miliary aneurysms, pial vessels ventral surface of the pons.

According to Andriezen the series of early changes in dementia illustrated by insomnia, amnesia, incapacity for attention and mental exertion and fatigue can be explained pathologically by progressive nutritive and dynamic changes. The nerve cell of the dement is stimulated beyond its average limits and at a greater pace than it would be in health. As he describes it, "The result is quickness, rapidity and overflow of ideas followed by fatigue and drowsiness, and this in turn by a sub-conscious condition in which there is a continuous and distressing whirl of nerve currents through the brain." The repetition of such attacks causes permanent damage to the nerve cell. Delusions of suspicion and maniacal outbursts are explained by him as the result of destruction of the neuro-protoplasmic plexus of the molecular and ambiguous layers.

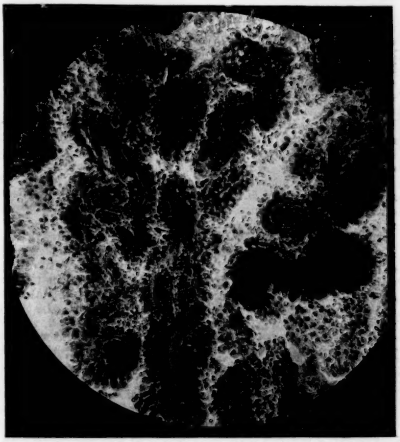

FIG. 13.—Higher magnification of the preceding.

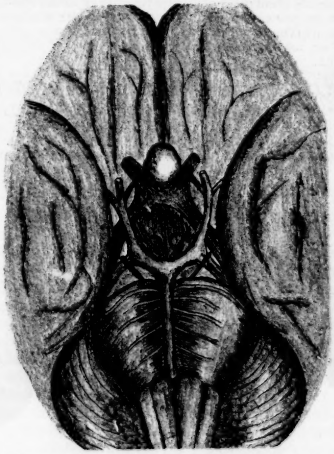

FIG. 14.—Aneurysm of anterior communicans artery.

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Andriezen: Some of the Newer Aspects of the Pathology of Insanity, Brain, 1894; Journal of Mental Sciences, 1894.

DISCUSSION.

Dr. CHARLES K. MILLS—The lady was a patient in private

practice. There was no possibility of either alcoholism, syphilis, or any of the common exciting or predisposing causes of insanity of this kind being present, so it furnishes us with a non specific and non-alcoholic case. This case is interesting in connection with the entire question of neurasthenia, and also in relation to the pathology of melancholia and non-specific dementia. The paper bears out the views advanced by Dr. Dercum, which we endeavored to place upon a firm basis of the pathology of neurasthenia, and bears out the views as perhaps best elaborated in the remarkable series of papers which were eventually put into a monograph by Dr. Cowles of Boston, on "Neurasthenia and the Development of Insanity." Doubtless this patient had some inherent tendency to mental disorder, but that does not alter the question as to the bearing of these investigations upon the pathology of the subject.

Dr. F. X. DERCUM—My own conception of the pathology of insanity, presented some years ago, is about as follows: It embraced the changes more especially in the neurons, but especially did I lay stress on the possible toxic causes of insanity. There are a great many facts to prove that we have toxins circulating in the blood; certainly the toxicity of the urine is very pronounced in some forms of insanity, while it is diminished in others. It is diminished, for instance, in melancholia, while the toxicity of the blood is increased in mania.

It seems that these changes in the nerves and blood vessels are only referable to some irritant, something that necroses the collaterals, the dendrites, and that destroys the chemic constitution of the protoplasm in the nerve cell.

Here we have changes taking place in a non-specific and non-alcoholic case, and yet, to my mind, there must have been some substance in the blood which acted in this destructive manner upon these delicate structures in the brain and in the nerve centers. When we have a case that appears to be auto-toxic the general autopsy is of the utmost importance. In this case the most elaborate studies would have been repaid, including the study of the viscera as a whole, and of the bone marrow. Even studies of the blood in the dead subject might have been repaid. We see here terminal changes, resulting changes; the primary cause is still to be sought after. In the various laboratories of the State hospitals for the insane a large amount of work should be done, not only upon the dead brain, but upon the living individuals, and it should be largely experimental in character. We are still far behind in our knowledge of the chemistry of the urine, and we have to adopt coarse physiologic methods to determine the presence of toxic bodies there. Especially should there be experiments as to the changes which arise in the nerve cells of guinea pigs to see whether they are similar to the changes which occur in the human. In the same way we ought to experiment with the serum of the blood of the insane.

ALCOHOL AS A CAUSATIVE FACTOR IN DISEASES OF THE CENTRAL NERVOUS SYSTEM.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, Pa., June 1-4, 1897.

BY T. D. CROTHERS, M.D.
SUPERINTENDENT OF WALNUT LODGE HOSPITAL, HARTFORD, CONN.

Next to syphilis, alcohol is the most frequent cause of diseases of the brain. In many instances it is more virulent, rapid and pronounced in its effects and is now fully recognized as a poison of the narcotic class.

Its general action on the system is seen in irritation, deranged functional activities, diminished force and narcosis. Some instances show marked narcosis from the beginning. The first effect of alcohol is to produce functional disturbance, and such poisons are called narcotic and neurotic, because their most conspicuous action is on the nervous system. Apparently this effect is transient, and the injury is supposed to be indicated by the repetition of the functional disturbances. A fatal dose acts like other tissue poisons, producing narcosis and necrosis. Alcohol while being carried to all parts of the body acts, like other poisons, on those parts which it reaches with the least amount of dilution, particularly the stomach and liver. Unlike other poisons, it seems to have a special affinity for the brain and nervous system. The vascular disturbance and consequent nutritional derangement are most prominent. The effects of alcohol in what are called chronic states, may vary widely in persons who are termed steady drinkers, and others who are not supposed to be injured by alcohol, up to those who are notoriously degenerated from its use, may be grouped as follows:

1. General temporary exaltation of the brain and emotional activities, followed by depression and feebleness, loss of memory and change of character and conduct.

2. General diminished power of attention and volition, particularly in the sensorial and kinesthetic centers and their connections.

3. Diminished energy and adaptability of conduct to the conditions of life.

4. Diminished muscular power and demand for help or stimuli to do the ordinary work of the system.

5. From the first a marked blunting and deepening obscurity of the moral and ethical sense.

6. Insomnia, diminished power of sleep and recuperation, with a nutritive break down of the stomach and brain.

7. The relations of the *ego* to the external world become disturbed followed by melancholy, suspicion, delusions, hallucinations and changed emotional states all merging into various chronic insanities.

These groups of symptoms are seen in all cases, not in a continuous order, but varying widely. Sometimes one is much more prominent than the other, but in all cases the psychical disturbances are present. The diminished sensory functions and the lowering and obscuring of the higher ethical sense of duty and the relation to the surroundings indicate a profound nutritive and dynamic failure of the nerve elements of the brain. While these are the well-marked symptoms of all cases who use alcohol excessively they are by no means absent in those who are supposed to use it in moderation. There are no dividing lines on one side of which the poisonous action of alcohol can be seen, while on the other it is absent. The fact is that alcohol, like other poisons, varies in its effects on different persons, producing in certain organs more prominent effects than in others; in certain cases concealed for a long time, then bursting out, revealing a degree of degeneration unsuspected; concentrating on the liver, stomach, kidneys or heart, or suddenly developing into serious lesions of the higher brain centers.

To understand more clearly the influence of alcohol in the causation of disease of the central nervous system, a study of some central facts of the dynamics of brain energy and force will be useful. All nerve force and brain activity is physical energy in motion. This energy is gathered and released and is technically only a variety of motion the same as is electricity. It is transmitted motion, but not electricity, although the latter is transmitted in the same way. It comes from nutrition, from chemic and molecular changes and is stored up and released by certain activities. It may be quickened, retarded, changed, increased or withdrawn.

It is the transmission of this energy along the nerve tracts to all parts of the body that constitutes life, and with all its attractions and repulsions and the continual readjustments of the delicate equilibrium necessary to sustain the work of life this is carried on with exact and absolute precision. Nothing in the

range of human knowledge can compare with the perfection and minuteness of these dynamic processes going on in the neurons and protoplasm of the brain. The force displayed in muscular activity, the contraction and expansion of the molecules as energy is liberated and transmitted along the fibers, well illustrates the marvelous mechanism of the brain.

This energy can be changed by foods, by drugs, by environments, all of these being new sources of energy, which may add to or pervert and exhaust the present sources, or more commonly may change the direction and power of this energy or depress it below normal levels. This is clear from a change of function and normal activity of the body. What we call disease is a change of the chemic conditions of the body and consequent alterations of nerve force and energy.

This is noted first in deranged functions and disturbed energies, which seem to act out of harmony with the surroundings. Functional disturbance may reach a point where it becomes convulsive and displays a flow of energy along new paths of discharge. What is called nerve-storms is the unrestrained convulsive concentration of nerve force and the repetition of this, in epilepsy, is disease. Drugs which change this release of energy may be dangerous, in not only destroying the equilibrium of forces, but the power of adding new energies and increasing or diminishing the direction and rapidity of the energy. This gives some conception of the mechanism of what is called inhibition and resistance. In early life the energies of the body may be easily augmented and perverted. The functional changes may register these states. In later life defective nutrition and chemic changes break up the normal flow of energy. This breaking up of nerve energy and irregularity of the movement of nerve force is most strikingly seen in epilepsy and convulsive irregular discharges of nerve and muscular power. This energy is renewed during a period of building up; then it is released in a convulsive discharge of force. These are some of the facts which bring us to a point of view where the action of alcohol can be seen more clearly. The fact that alcohol, even in small doses, produces functional disturbances in the brain and nervous system is very significant of derangement of nerve energy and motion.

Another fact admitted beyond all controversy is that alcohol has a special affinity and positive action over the brain and nervous system. Its effects are seen here more than any other part of the body. The increased heart action points to a release of energy, and the blurring of the senses show that energy has been diverted and changed from its normal channel.

In many cases alcohol is used up to the toxic limit of full narcotism. Then a period of absistence follows. After a time these cases become periodic, and the drink-storm occurs with regular or irregular intervals. The exciting causes of the return of the paroxysm are complex and uncertain. Each paroxysm is longer, more intense and followed by greater prostration. The first glass of spirits seems to both liberate and concentrate nerve energy in a convulsive demand for more spirits until narcotism comes, and even then the demand continues long after the capacity to retain it has passed away. This convulsive discharge of nerve energy as in epilepsy becomes a disease of the central nerve centers. Like epilepsy, it may continue for years before ending in death.

Alcohol may act as an exciting cause, exploding and concentrating unstable elements of nerve force, rousing up latent predispositions and precipitating degenerations. Periodic convulsive drinking belongs to the family of epilepsies, and has many symptoms in common. They are both central nerve diseases and follow a uniform course to the same end.

General paralysis is another disease which dates from the use of alcohol. In nearly all cases alcohol is used to excess at some time in the progress of the case. It is a symptom as well as a cause, and it is often difficult to separate one from the other. Pneumonia, nephritis, cirrhosis and other acute organic diseases follow the use of alcohol, and are the natural sequel of acute degenerations.

It is not possible at present to specify any particular diseases which are caused by the action of alcohol alone. Like the poison of syphilis, alcohol seems capable of producing the most complex degenerations in every organ and tissue of the body. It not only brings new abnormal force to the brain centers, but deranges and perverts that which exists. Pathologically the injury seems widespread and general, affecting cell and tissue alike, both retarding nutritive cell growth and waste elimination; physiologically deranging the functions of the organs and then the structure, diminishing their normal activity and capacity. Psychologically it effects the higher brain centers, with a literal general paralysis going on down to the lower centers and functions following a graded line of dissolution. Structural injuries of the peripheral nerves, which comes directly from alcohol, are common. In chronic cases these injuries are well recognized, but in moderate and periodic drinkers they are overlooked. They are called rheumatism and neuralgia in cases where the cause of alcohol is not prominent. I have found these lesions in persons who have abandoned the use of alcohol or have long free intervals of sobriety. The injury from alcohol, which begins as interstitial inflammation, becomes a parenchymatous degeneration, and is confined to the sensory nerves first, and the brain later.

Ataxia and loss of muscular power comes on in the later stages.

Alcohol seems to have a special toxic action over the peripheral nerves. Arsenic and other minerals have a like power, and we are able to differentiate a number of different forms of neuritis.

Alcohol as a factor in diseases has two very pronounced actions. One on the dynamics of nerve force and the other on the nutrition and source of supply and energy. The nerves are over-excited and depressed and then activity is perverted, and the power of restoration from nutrition destroyed. The two central processes of life, waste and repair, are affected, one increased and the other diminished. These facts seem to be sustained by a great variety of evidence which admits of no other interpretation.

In clinical studies of cases the inebriate, or the person who uses alcohol in so-called moderation, may not exhibit symptoms of well marked disease, or of diseases which are described and classified in the text-books, and yet the evidence of exhaustion, degeneration and general derangement is always present. There is present in these cases a profound lowering of nerve energy and vigor, associated with a prodigality of waste and delusions of strength that is not apparent to superficial observation.

The apparent recovery from the narcotism of single drunk paroxysm is never real. The convulsive discharge of nerve energy through the actions of alcohol

permanently derange the dynamic equilibrium of the nerve centers. Its repetition fixes this condition, and the power of resistance to disease becomes less. Local inflammation from infectious agents, from injuries, strains and drains, can not be overcome and death follows. Alcohol has been the factor which made these conditions possible, and destroyed the *vis medicatrix naturæ*.

In this general outline of the facts concerning the power of alcohol as a factor in central nerve disease, the following facts may be restated:

1. Alcohol is a poison of the narcotic class, with a special tendency to act on the brain and nervous system.

2. In a general way the effects of alcohol are the same. Disturbing the functional processes and diminishing the sensory activities, ending in general muscular depression and mental enfeeblement.

3. A general psychical paralysis beginning with the *ego* and extending to all parts of the body, varying in some slight degree, but marked in all cases.

4. In dynamics of the brain there is a continuous gathering and discharge of nerve energy. This is increased, retarded and perverted by drugs, foods and environments.

5. The change of this nerve energy is seen in the functional disturbances of the body. In early and late life it is very prominent.

6. Alcohol produces marked functional derangements. It both releases and concentrates nerve energy. The increased and diminished vascular actions, with diminished sensory power, point to profound disturbances of the dynamic forces of the brain.

7. Periodic drinking is a convulsive disease like epilepsy, and is of the same family group. General paralysis is another similar disease, associated with exhaustion.

8. Alcohol acts on the body psychologically, physiologically and pathologically, and is a literal paralysis and dissolution.

9. No other substance known in common use has such a profound destructive action on waste and repair of the body.

10. This opens the door for many diseases by destroying the power of resistance and enfeebling all the powers of life.

INEBRIETY AND TUBERCULOSIS, ALLIED DISEASES.

Presented to the Section on Neurology and Medical Jurisprudence at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, Pa., June 1-4, 1897.

BY T. D. CROTHERS, M.D.
SUPERINTENDENT WALNUT LODGE HOSPITAL,
HARTFORD, CONN.

The very close relationship between these diseases has been noticed for many years.

In certain families, tuberculosis and inebriety alternate. Some of the members will drink to great excess, then abstain, contract tuberculosis and die. Others will have all the symptoms of tuberculosis, begin to drink and recover from the consumption, become inebriates and die suddenly of acute pneumonia or nephritis. It is very commonly observed that inebriates who abstain from all use of spirits, calling themselves cured or reformed, soon contract tuberculosis and die. Such cases are very acute and rapid in their progress and termination. Another fact never understood was the apparently abortive influence of alcohol in early stages of tuberculosis. The old-time prescription to drink all the spirits possible when lesions of the lungs were made out, always ended either in precipitating the disease to more rapid death or a low form of dementia and inebriety. The latter was always associated with delirium and exhaustion, and terminated in some acute disease.

The following case represents a class which will disappear in the near future when this subject is better understood:

A., aged 22, had incipient phthisis; he was given at regular intervals large quantities of whisky, and a year later recovered, but continued to use spirits. For the next five years he drank continuously and became demented. He was placed in an asylum and recovered; this was followed by bronchitis and fears of returning phthisis, and he returned to the use of alcohol. He is now a low imbecile inebriate. The frequency with which these diseases appear associated and following each other are attested by all students of inebriety.

In my experience with 2000 cases, fully 20 per cent. are associated with tuberculosis. I believe a much larger percentage of all cases of inebriety die finally from tuberculosis, of which probably there was no intimation until at the end of life. These associated cases have a common heredity and a great variety of common symptoms, which are apparent to all close observers. Dr. Maudsley, in "Pathology of the Mind," has described a class of cases which inherit qualities of mind and body that end in both tuberculosis and insanity. They are called phthisical insanities, and although they have no signs of tuberculous deposits or insanity, there is present a peculiar predisposition, which quickly merges into the one or the other from the slightest causes. These symptoms are marked in a large number of inebriates before inebriety is developed, and are of the same family type and identical in many ways. Such persons possess an intensely active nervous organization. They are quick, irritable, passionate, fanciful and changeable, eager in project and impatient of opposing delays, very idealistic and unstable of purpose, brilliant in flashes, but always wanting in breadth and calm depth of thought and in methodical steady perseverance. They are always quick in thought and intense in their energy; seeing the project of the hour they press toward its realization as the only important thing in the world. In a brief time they turn to some other scheme and abandon the first. In all they do there is the same fitfulness of energy and display of imagination, with hectic credulity and irregularity of thoughts, feelings and actions. There is another class, more of the imbecile type; they are dull, heavy, impetuous and unreasoning, with little or no self-control, usually gormands and have no other pleasure than to gratify the impulses of the moment; usually have marks of defective growth and degeneration, and sometimes are prominent in business enterprises and show much activity of mind and body. In both of these classes inebriety, insanity and tuberculosis are almost certain to appear alternating one with the other. They are heredities of the same class, states of defective and retarded growths, followed by exhaustion and low vitality. The ancestors of these persons were very largely inebriates, insane and tuberculous.

Insanity is not so frequent, and seems to depend on some peculiar exciting causes which can be traced, such as injury, sunstroke and some peculiar mental strain.

Inebriety is simply narcotism to remove the pain and suffering from the defective functional activities.

Heredity has left the person with low and defective vitality, with feeble power of resistance and inability to adjust himself to the changing surroundings. He is in a state of chronic exhaustion, continually using up nerve energy that is replaced with great difficulty. His defective brain is unable to conserve force and hold it in reserve for emergency. Hence the seductive relief which comes from the narcotism of alcohol. Inebriety is only a symptom of this central bankruptcy of energy and power to develop force for the functional activities of life. The same conditions of weakness and degenerations diminish the power of resistance to the attacks of microbes and tuberculosis. Also the same conditions make the narcotism of alcohol fascinating and create the impression of strength by concealing the physical pain and demands for relief. In the latter case the degenerations go on, more profoundly effecting the higher centers with sensory hallucinations and delusions and changing the metabolism of the body. While alcohol apparently checks the invasion of the microbes and changes the symptoms, it creates new centers of degeneration and destroys the powers of resistance to every condition of strain and drain on the body. The removal of alcohol rouses the predisposition and favoring conditions of the soil for the growth of the bacillus.

If the degeneration has not taken on acute forms in other centers as in inflammation, tuberculosis may follow. A great variety of facts attest these observations and suggest a wide field for more exhaustive studies. One of these facts shows that families of inebriates and consumptives are often very fecund and numerous. Where the degeneration of the parents is unmistakable, the number of children born are often very large, confirming the oft noted fact, that just before the final extinction of the race a supreme effort is made to perpetuate the seed and save it from final extinction. The oak tree about to die will be over-burdened with acorns. The mongrel dog, whose race is nearly run out, will have an unusually large litter of puppies, which will die in infancy. While the families of inebriates are often very large they do not live long. If they live through childhood, they carry with them into maturity defects which soon end in extinction. Two degenerate members of a famous family in New York married. Both were moderate drinkers. Of the thirteen children born five died in infancy and eight grew to maturity. Three of this number died of tuberculosis, and were inebriates, one succumbed to acute pneumonia, one became demented, two died of some low form of fever associated with rheumatism. One is still living, but is feeble-minded, and has been eccentric and partially demented all his life. All the decendants of these persons are dead.

Another typical illustration of this class came under my care. Three members of a family of nine came for treatment for inebriety. One relapsed and became insane; the second was killed by accident; the third is a low drunkard; two of the remaining children have died of tuberculosis; one is an eccentric reformer with extreme zeal and little wisdom; one is a paranoiac single woman. The parents of these children were wealthy, drinking persons, without business, who died in middle life from some acute disease.

These dying families are by no means uncommon, especially in the older sections of the country They appear in the two extremes of either great fecundity or barrenness. In one case a sudden large progeny will follow, in the other barrenness, and in both profound constitutional diseases appear with tuberculosis, inebriety and insanity in its obscure and modified forms. Where a general history indicates that the family is degenerating, growing weaker in appearance and conduct retrograding, tuberculosis and inebriety with hysteria, eccentricity, rheumatism, and a variety of nerve disorders are almost certain to follow. Inebriety and various forms of drug addictions come first, then tuberculosis or acute affections such as pneumonia, hepatitis, nephritis and affections of the heart. These facts are not observed carefully because often the person or victim manifests some unusual form of vigor and ability before these diseases appear. A son of one of these dying families took high honors at college and entered professional life with brilliant prospects. He attained eminence, suddenly became an inebriate and two years later died of tuberculosis. His inherited degeneration was overlooked in his precocious brilliancy, and display of vigor masked the early dissolution which concentrated in inebriety and tuberculosis. Not all these cases become tuberculous or inebriates; other organic affections appear. The heart and kidneys suffer with the stomach, and a great variety of nervous affections which are likely to concentrate on the lungs, or depress the nerve centers to such a degree as to demand narcotics for relief. This sudden or gradual lowering of the co-ordinating nerve centers in vigor and power may be felt first in the lungs, and then the microbe's soil is ready for the growth of tuberculosis. The inheritance of low vitality and a predisposition to seek relief in spirits and drugs that cover up and relieve this pain and physical unrest, still farther lowers the nerve centers of co-ordination, literally enfeebling the power of resistance to all microbic invasions, and making the possibility of tuberculosis more certain.

The neurotic origin of tuberculosis has been for many years urged by Dr. Mays of Philadelphia, in many able studies. He has shown conclusively that tuberculosis is far more common in feeble-minded neurotic families. He has proven that it follows more frequently in families of inebriates and those who are eccentric, hysteric and possess a neuro-psychopathic constitution. These facts are not new but have been observed by many competent authorities for years. Dr. Mays has restated them with much additional evidence and many new conclusions that are unquestionable, proving the neurotic origin of consumption.

The present great precautions used to prevent the transmission of tuberculosis germs overlook this fact. The common neurotic origin of tuberculosis and inebriety is also noted in the paroxysmal character of their progress and termination. Cases of tuberculosis come on suddenly, pass rapidly to a fatal termination, or are marked by long irregular halts and apparent recoveries, which are supposed to be due to certain remedies or means used. These halts are paroxysmal, irregular and followed by other diseases or death from the original disease. Climate cures, drug cures, food cures, are all secondary to nerve rest and hygienic measures which build up the brain and central nervous system.

Inebriety begins the same way, in many cases suddenly, and is followed by halts and paroxysmal changes. Then the drink crave breaks out again, subsides, then changes to acute inflammation of the lungs or kidneys.

A period of moderate drinking seems to prepare the nervous system for drink-storms and excesses.

In tuberculosis, bronchial catarrhs and irritations of the throat, lead up in the same way to pronounced tuberculosis. In many cases of tuberculosis a marked mania exists for drugs of some kind. This is the same craving for relief that possesses the inebriate. The former is filled with the hope of virtue in drugs, is credulous, expectant, ever ready to try every new thing, never doubting its possible good effects. Filled with delusions of strength and final cure of his malady, the inebriate has the same boundless confidence in his power to abstain and ability to use spirits at all times and recover from the effects. The similarity of these cases can be traced in a great variety of symptoms which are identical in both cases. In both of these diseases there are similar nerve degenerations which may concentrate on any organ of the body.

Dr. Alison, in an exhaustive paper on the etiology of cirrhosis and pulmonary phthisis among inebriates, found phthisis more common among those of active habits.

He studied eighteen inebriates in fifty-four cases of phthisis, and asserted (*Archives Générales de Médecine*, Paris), as his positive conclusion that the use of alcohol predisposed to consumption by lowering the powers of nerve resistance, and by creating a constant source of irritation in the bronchi and lungs from the elimination of the alcohol. He was also clear in his conviction that inebriety and consumption were interchangeable, one following the other from the same general causes and both more likely to occur before 40. After that, acute inflammations followed more readily.

Dr. Mays, in the *Journal of Inebriety* for 1889, reported a number of cases from German authorities where death occurred from some form of inebriety, and the postmortem revealed tuberculosis and lung degeneration. In the same paper he reports a number of cases of inebriety following in the children of consumptives, and of phthisis or consumption appearing in children of inebriate parents. Dr. Haycraft, in "Darwinism and Race Progress," declares that criminals, inebriates, lunatics and consumptives, are all born with neuro-psychopathic constitutions, and in no other affection does heredity play so important a part.

Dr. Irwell, in "Racial Deterioration," describes the neuro-psychopathic constitution as a permanent condition of defect and weakness of the psychical nerve centers, noted in instability of nerve and brain power, lack of persistency, headaches, insomnia, indigestion, great susceptibility to environments, exaggerated emotional activities and a general insane temperament.

Dr. Williams, in his work on pulmonary consumption, written some years ago, describes the close relation between inebriety and consumption, calling them members of the same family group of diseases, one alternating with the other.

The fact has been noted by many specialists that inebriety often terminates in acute inflammation of the lungs and kidneys, coming on suddenly, showing that exhaustion has a special tendency to concentrate in this way.

Dr. Clouston of Edinburgh, in a late report says, that it is surprising how often insanity, consumption and inebriety appear in the same family and follow down to extinction among the descendants.

When one of these diseases is present the others are most likely to follow. Dr. Payne, in his "Pathology of Chronic Alcoholism" says: "I can find no evidence to support the opinion that the free use of alcohol checks the progress of tuberculosis." On the contrary, the impression seems well founded and firmly held by many authorities that inebriety follows tuberculosis, and that they alternate one with the other frequently; at least there can be no question that they are very frequently associated.

Dr. Sharkey, in the London Pathological Society, claims that disturbances and lesions of the vagus nerve by lowering the nutrition of the lung, predispose it to become the nidus of the bacillus of tuberculosis. Hence all inebriates are predisposed to tuberculosis, and are more likely to contract this disease than any others.

The evidence of the neurotic origin of tuberculosis is often overlooked in bacterial study. The same extraordinary care to prevent infection in public places should extend farther back to heredity, alcohol and the great strains and drains that lower the vigor and lessen the power of resistance and make it possible for bacteria to find favorable soil for the destruction of the body.

THE INFLUENCE OF HYPNOTIC SUGGESTION UPON PHYSIOLOGIC PROCESSES.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-eighth Annual Meeting of the American Medical Association at Philadelphia, Pa., June 1-4, 1897.

BY R. OSGOOD MASON, A.M., M.D.
NEW YORK, N. Y.

That hypnotism is a fact, and that the power of suggestion is marvelously increased while the patient or subject is in the hypnotic condition, are now truisms to all who have been students in that domain of psychology to which these subjects belong. The old rubbish of superstition, supernaturalism, and even of occultism, is in part at least swept away, and these two facts now stand out clear and distinct. It remains, by observation and experiment, to test their possibilities and ascertain to some degree the limit of their influence and usefulness.

Permit me to remark regarding the general drift of therapeutic practice in nervous diseases no less than in other departments of clinical work, that notwithstanding the tendency to specialization, and the multiplication of remedies in each special department, still amongst the wisest and most conservative in all directions the tendency is toward moderation and simplicity in the use of remedies; and thought is given especially to the repair of organs through physiologic processes, rather than the search for authoritatively endorsed specifics. Nothing can better illustrate my meaning than the treatment of epilepsy during the past thirty or forty years; there were first the salts of silver, then the salts of zinc, then the bromid of potash, and then that remarkable shotgun invented by Brown-Séquard, in which all the known bromids were combined; later the bromid of sodium alone was the favorite, and now the general feeling is that in the ultimate results bromids are harmful, and that diet, regimen, air, and regulated exercise are much the most important factors in the treatment of this formidable disease. In other words, attention is being directed from specifics to the consideration of what can best be done for the repair and healthy action of damaged nerve cells and imperfectly functioning organs.

I am aware that there is a very decided feeling in the profession that the uses of hypnotism and suggestion are extremely limited, and that a few nervous or imaginary diseases constitute their main field of utility. Let us inquire whether this impression is well founded; and as a single but most important department of that inquiry and one harmonizing well with the general trend of medical thought and practice, I will direct attention to the influence of hypnotic suggestion upon physiologic processes.

In studying this subject, as in all others claiming a scientific basis, the first thing is to present the facts. An abundance could be cited from well known and reputable authorities; I will, however, confine myself to those which have come under my own observation. I will briefly describe a few cases where physiologic processes have undoubtedly been so influenced.

1. The influence of suggestion upon the action of the stomach. M. M. was a public singer, and near the end of a New York season was thoroughly worn out and exhausted. Food was absolutely distasteful to her, and if taken was seldom digested, but generally vomited, and as might be expected under such circumstances, her voice had failed seriously. She was brought to me to see whether hypnotism could afford her any help. She proved an excellent subject and was put promptly into the deep sleep. I suggested that she would at once have a strong desire for food, would be able to take it freely, retain it and digest it perfectly; that her strength and vitality would, as a consequence, quickly return and that night there would be such an improvement in her voice and singing that it would be the subject of general remark, and that her friends would congratulate her.

Her midday meal occurred directly after leaving my office, and her friends were amazed at the food which she ate with enjoyment. It was retained and digested, her strength and vitality were at once improved, and the improvement in her voice and singing was actually, on that same evening, the subject of favorable comment. Two more treatments carried her through her engagement with comfort and credit.

2. The influence of suggestion on the function of the lower bowel. Miss A. was a bright, intelligent educated German, 26 years of age, free from any hysterical or unusual nervous symptoms. She was the subject of obstinate constipation, and seldom had a movement from the bowels without medicines or enemata, often going unrelieved four or five days, and it was then with difficulty that even partial relief was secured. She was easily hypnotized, and one evening, while in the hypnotic condition, was given a single teaspoonful of pure water, with the suggestion that it was a bitter dose but very powerful, and that it would give her a perfectly free and full evacuation at 7 o'clock the following morning. She took the water with many grimaces at its bitter taste, and the suggestion was realized with such promptness and energy as to awaken her suddenly from sleep at exactly 7 o'clock, and to be the occasion of serious inconvenience.

3. Its influence on the menstrual function. Miss F., 18 years of age, menstruated at 15 and was a fully developed and usually healthy girl. She consulted me on account of the absence of the menstrual flow, which had not appeared during the previous six months; she was, at the time, pale and anemic. She was put into the condition of light sleep, during which I suggested improved digestion and assimilation of food, causing the production of a richer blood and a better nutrition; also that her menstrual flow would occur at its proper date, two weeks from that time. I ordered her to continue asleep one hour and then awake. The same treatment was given twice more at intervals of four days. At the time suggested the menstrual flow returned; her health was improved and the improvement was permanent.

4. Its influence on lactation. Mrs. H. was a young mother, primipara. Her infant was two weeks old, and notwithstanding care had been intelligently given to secure a proper supply of milk, scarcely a drop appeared, and the child had to depend entirely on artificial feeding. The mother was anxious to nurse her baby and I proposed hypnotism. She proved a fairly good subject and went easily into a condition of light sleep, in which I suggested that the organs for supplying milk were perfect, and only needed stimulating to proper action; that at 1 P.M., it being then 11 A.M. she would take her bowl of hot gruel, and at 2 P.M. she would feel the milk coming freely into her breasts and that there would be an abundance for the baby. The suggestion was exactly fulfilled in every particular, and at 2 P.M. the babe had a full and satisfying meal from the mother's breasts, and artificial feeding was discontinued.

5. Its influence upon absorption. Mrs. X., 26 years of age, had been an invalid four years. Her condition was the result of pelvic cellulitis following a miscarriage. The right broad ligament and ovary were still involved; were greatly thickened by plastic deposit and very tender and painful on bimanual manipulation. Her menstruation was excessive in quantity, lasting seven or eight days, and was accompanied by large clots which were expelled with great pain. She was a complete invalid, constantly under the doctor's care, and though of an unusually active temperament was obliged to spend weeks at a time in bed. She was thin in flesh, badly nourished, nervous and anemic. A competent and conservative gynecologist had advised the immediate removal of the ovary as the only hope for improvement. Three days later she consulted me, and I advised delay, with the expectation that great improvement would speedily occur as the result of treatment.

She proved an excellent subject, and I suggested first, ability to take food, improved nutrition and the disappearance of pain and discomfort from the pelvic region; and these suggestions were promptly realized. Then followed the suggestion that the process of absorption would be stimulated and the adventitious deposit, from the old inflammatory process would be gradually taken up and removed; that the congestion of the uterus and pelvic viscera generally would be relieved, and that the circulation through these organs would be unobstructed. Then that menstruation, when it occurred, would be normal in quantity and free from clots and pain. This was eight months ago. Improvement commenced immediately in her nutrition with relief from pain; then followed a more normal flow at the menstrual periods; the thickening and tenderness of the adnexa of the uterus upon the right side were distinctly diminished and today very little difference can be detected in the two sides; menstruation is normal and painless. Very slight tenderness of the ovary of that side can be detected on bimanual manipulation, but her general health is good. She is well nourished, of good color, cheerful and hopeful.

It will be noted that the suggestions were not all made at once, but successively, as her condition demanded, and always with a distinct appreciation of the physiologic processes which should be stimulated or controlled in order to bring about the desired result. In making the suggestions it was not sought to use language adapted to the comprehension of the patient in her normal condition, and that used was never heard by her or at least never became a part of her usual consciousness.

I will not give a needless detail of cases, though they could easily be multiplied. I simply wish to call attention to the fact that in a great variety of cases and a multitude of instances physiologic processes have been influenced and controlled by suggestion.

Numerous cases have been reported by Liébault, Bernheim, Leigois, Dumontpallier, Burru, Krafft-Ebing and many others, where suggestion has produced changes in the physiologic processes of the body; changes in the heart's action, in temperature, in the vascular and vasomotor systems, causing the raising of blisters, bleeding from the nose or oozing of blood from designated points upon the surface of the body, and increasing or diminishing the various secretions of the body. With the knowledge of such facts before us, stigmatization, the reported cases of which now exceed 100, ranging from St. Francis of Assisi in the thirteenth century to Louise Lateau at the present time, becomes credible, and may be studied with interest and profit, and without loss of caste, even by persons of rigorous scientific orthodoxy. In fact, the old adage, "There is nothing that makes a man suspect, more than to know little," is most applicable to the matters here presented.

The field then in which hypnotism and suggestion are effective and may be made useful is not limited to nervous or imaginary diseases, but extends to a large class of functional disorders, and in some cases at least, and under some favorable circumstances, to serious organic disease; and the assistance rendered by suggestion in these cases is perfectly natural and scientific, and is due to its influence upon physiologic processes, stimulating, retarding and regulating with a certainty and success, varying according to the susceptibility of the patient and the knowledge and skill of the physician.

HYPNOTISM IN THE TREATMENT OF DISEASE.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY U. O. B. WINGATE, M.D., M.M.S.S.

Professor of Diseases of the Nervous System, Wisconsin College of Physicians and Surgeons, Visiting Physician to St. Mary's Hospital, Consultant in Neurology, Presbyterian Hospital, etc.

MILWAUKEE, WIS.

From the earliest period in the history of the healing art, there has always been a strong tendency to accept any mysterious or unknown agency in the treatment of disease; more especially is this acceptance favored by the less learned in science, and among those afflicted there is always found a large clientage who are ready to be operated on by anything surrounded by mystery or pertaining in any way to the occult.

Hypnotism, undoubtedly, owes to the mysticism that surrounds it its existence and practice. If it were better understood, no doubt it would be neglected and soon forgotten with the host of other agencies that have existed in the past and lost their charm as they became understood.

To the scientific physician it fails to create confidence enough to be of much use, and its employment is now apparently largely in the hands of that class of practitioners who seem to play on the credulity of the public more than to treat disease in a strictly scientific manner. I am well aware that I am open to severe criticism by some, but I base my statements upon my own experience and observation. With a large acquaintance with practicing members of my profession, I have failed to find but few who care to make use of hypnotism as an agency in their practice, and those who do use it appear to do so more as an experiment than as honest scientific treatment. In the use of it myself I have always felt some degree of guilt, and am sure I could have accomplished similar results with agents that are more scientific, more satisfactory, and with a feeling that I have not left behind conditions that may be harmful, for I am sure that the results of the use of hypnotism, in many instances, may be harmful.

If the nature of hypnotism be such as Maudsley describes, and I see no good reason to doubt his conclusions, surely we should think long and carefully before employing it in our practice. He says:

"What may we suppose to take place when a person is thrown into such a trance in which, machine-like, he is governed by suggestions which the operator makes, touching, tasting, seeing, hearing, thinking and doing just as he is bid? That by the special suggestions made, the fit tracts of his brain are stimulated to a separate and pretty nigh exhaustive activity, while the functions of the remaining tracts are suspended. Thereupon he can not choose but perceive as he has been made to think; must translate every impression on sense into the language of the solely activeidea, and shape to its features, or else have no consciousness of it at all. He can not possibly perceive in the terms of ideas that are entirely inactive. The one active cerebral tract is virtually the whole and sole mind which he then has, and to obey it in sense and act is a compulsive necessity. For the time being he is effectually severed from full mental contact with things as if he had been educated through life to exercise that tract and none other, or as if he were a madman, dominated by its morbid growth and function. There is good reason then, why persons of weak and unstable nervous temperaments can, while persons of strong, compact mental organism can not, be thus put out of possession of themselves, and why those who have frequently allowed their mental being to be thus dislocated become so unstable, at least as to fall out of mental joint at the least suggestion. Nay more, there are persons who under enthusiasm, or other mental excitement, can perform a self-hypnotism, and afterward so cultivate the acquired function by strain and practice, as to repeat the operation at will, with the greatest ease." Such is the character of this agency, which no doubt has existed as long as the history of the treatment of disease varying in degree of potency in different ages and under different conditions of the human family.

That we are living in an age where from the activity and strife and strain of life, in a severe struggle for position and existence, coupled with a heredity that is becoming more and more conspicuous, when there is

great weakness of the human mind and tendency to nerve deterioration and mental decay, no one who carefully studies the events of the times can fail to observe. This condition produces a large train of human minds that crave leadership, in other words, minds easily influenced by suggestion; hence we see hypnotism more easily practiced than in some other periods in our history. Human credulity seems to be at its highest point, the great masses of the people are capable of being easily led by the suggestions of the few, and such a condition can not be considered as a healthy one in the body politic. If it be true that by the practice of this agency, we weaken the subjective mind instead of giving it strength, if by repeated suggestions it becomes more and more easily affected, and dependent, surely such treatment can not be of advantage to the subject, but on the other hand, we are increasing the weakness of the will of the individual, and surely in this direction madness and mental decay lie.

To quote again from Maudsley, relative to hypnotism: "The compact consciousness of the supreme centers has become broken up, a discordant tendency fostered, and the disassociated centers are prone to continue their abnormal and independent action. This state frequently follows too oft repeated hypnotic experiments in the same individual, and assuredly that way madness lies."

Charcot said nothing of the therapeutic uses of hypnotism. He indeed pointed out that a woman who had hysterical paralysis of one leg, walked about and seemed cured during hypnosis, and that though he might temporarily remove the paralysis by suggesting its disappearance, that such a remedy did not treat the disease she labored under, but only allayed one symptom. He treated his cases of hysteria according to the best principles known, namely, seclusion, fattening foods, and the physiologic mode of living.

Dr. Robertson states that it is the general opinion of the medical profession in Nancy that while hypnotism has done some good, in many instances its general affect is more harmful than beneficial, inasmuch as the general belief by people in occult powers, and the power of one man's mind over the conduct of others weakens will power and thus becomes injurious.

There is no doubt but that outrage can be effected in the hypnotic condition, and although it may be doubted if crime can be committed, it seems that the weight of evidence is largely in that direction.

All writers on the subject condemn public exhibitions of this practice, and I believe the time will soon come when its use by the medical profession will entirely give way, as I believe it should, to safer and more scientific methods of practice, and by other therapeutic agents.

204 Biddle Street.

DISCUSSION ON PAPERS OF DRS. MASON AND WINGATE.

Dr. T. D. CROTHERS—Suggestion is a physiologic, and not a pathologic process. I believe it is more absolutely certain than Rochelle salts or any other medicine that we are in the habit of using. I know that no man can practice medicine without suggestion; you may call it personality, or magnetism, or may attempt to define it, but in reality it is suggestion.

Dr. TAYLCHELL—In the last few months I have written 100 letters to leading psychologists, both in this country and in Europe, and have received 41 answers, only 2 of which were opposed, not only to the use, but to a better teaching of this subject in our medical colleges. Solomon Solis-Cohen of this city wrote that he believed in an all-round study of the mental faculty both in disease and in its cure. I believe the time is coming when, not only will every physician throughout the land recognize this factor in treatment, but it will be taught in all our medical colleges. As to the injury done by hypnotism, how many of us are absolutely certain that any of our drugs does not produce evil effects? How many of us will use morphia, or any potent drug, and feel absolutely certain that in any given case he will produce no injury?

Dr. MOYER—I do not see the great dangers to be apprehended from hypnotism, and I suspect that suggestion, which I think is really what is understood by hypnotism, has been used almost from time immemorial, and that it explains a vast deal of the phenomena in the nervous system in disease which is not explicable on any other theory. It is only of late that I have been employing hypnotism at all extensively, and it is almost routine practice with me to hypnotize about all the patients that come to my clinic. I have yet to see any bad results. The number of cures that have been effected in this way is quite numerous. I can recall one striking case of hysteric paraplegia in a man who was brought to my clinic with great difficulty, partly carried up the stairway, and before he left was able to walk down the stairway. Another, an hysteric hemiplegic who had not been employed for four years, has resumed his work after four treatments of hypnotic suggestion. Suggestion has a wider range than that. Even in organic affections the patient becomes more hopeful and confident, and his general condition improves.

Dr. MASON—I had supposed that all were accustumed to look upon hypnotism as a fact, and one which we are gradually learning to apply scientifically, by means of methods of observation and drawing conclusions. Any statements in regard to the physical effects of hypnotism upon the brain are purely hypothetic, and there are no facts upon which to base any statement of this kind. Of course, from continuous hypnotism of one subject we might possibly have uncomfortable effects, but this is true of almost any other therapeutic procedure. I have used hypnotism twenty years, commencing before Charcot and Bernheim, and in all that time I have never seen an untoward effect of any sort whatever. Charcot endorsed hypnotism, and made use of it.

Dr. WINGATE—I do not understand that hypnotism is suggestion in the true sense. I believe that everyone uses suggestion; but when you render a patient unconscious, put him into the true hypnotic condition, then you make an impression upon him of an entirely different character. There is always a class of patients with whom this is repeated over and over again. We hypnotize certain patients continuously because we find it easy to do so, and I maintain that that constant brain action is injurious. I believe that hypnotism will in time injure the patient, and will not accomplish the good that is hoped for and expected.

A STUDY OF THE STIGMATA OF DEGENERACY AMONG THE AMERICAN CRIMINAL YOUTH.

Presented to the Section on Neurology and Medical Jurisprudence at the Forty-eighth Annual Meeting of the American Medical Association held at Philadelphia, June 1-4, 1897.

BY EUGENE S. TALBOT, M.D., D.D.S.,
CHICAGO, ILL.

The present contribution results from studies on young criminals made during 1895-96 at the State reformatories at Pontiac, Ill., and Elmira, New York. The investigation concerns especially the stigmata of the head and face. The stature and weight were noted, but other anthropometric data were not specially considered, as measurements had to be entrusted to others. It was therefore deemed advisable to avoid as far as possible elements of error concomitant on extensive detailed anthropometry. Only simple measurements easily obtained with accuracy were made. Inasmuch as facial and cranial development are, as a rule, most directly co-related with moral and intellectual evolution it was deemed natural that they should furnish sufficient data for discussion in an article of the present scope.

Since the inquiry dealt only with the physical stigmata of the head and face, the youngest inmates were, for obvious reasons (immature jaw and face development) excluded from consideration. The object of the inquiry was to determine the extent to which the

youthful criminal came from the ranks of the degenerate. The question whether a criminal type, distinct from other degenerate types exists, does not enter into the scope of this paper, and has not been considered. Besides the stigmata, age and race are included in the inquiry and discussion. Details as to parentage, heredity and antecedents would have been of interest, but could not be obtained with any accuracy. Certain data naturally lead to inference unnecessary to point out; for example, the predominance of the foreign born and those of foreign parentage, especially of certain nationalities.

The details as to those of foreign and native perentage mixed would have been of special interest for purposes of comparison. The mass of the youth examined came from the unskilled laboring class, and from the urban, as distinguished from the rural population. These facts are to be recognized when it is remembered that the two institutions are hundreds of miles apart and draw their population from differing communities. The two institutions have therefore been considered separately to eliminate elements of error. The total number examined was 414 at Pontiac, and 1018 at Elmira. The ages ranged between 15 and 30. The average at Pontiac was a little over 19 and 21 at Elmira. For purposes of comparison records were made as to weight and stature and these were tabulated according to age, nationality and color. Only three or four nationalities are represented sufficiently to be of value for statistical purposes. The others are given for the sake of completeness. The nationalities were tabulated by considering those of foreign parentage on both sides as foreigners and those with one American parent as native born. This was thought a better course than designating nationalities by places of birth. It was thought desirable to classify certain individuals by race rather than nationalities, but this was very difficult. The Jews, for example, in Pontiac are included among the Germans and Poles. Pontiac contained one full-blooded Indian, but many of the negro inmates had a considerable proportion of Indian blood. The negroes included all with an appreciable negro taint, but full blacks were in the minority. The two institutions differ in their constituents. Pontiac is more particularly a reform school and receives a larger number of misdemeanants, whom in New York are sent to Westchester, Rochester, etc., rather than to Elmira. From the tables it will be evident that an older class of cases is received at Elmira. In tabulating, only those inmates of Elmira of 30 years and under are included; in Pontiac, the oldest is 26. The first table gives data as to age, stature and weight in the two institutions. This table does not include the whole number examined since it was impracticable in a few cases to obtain weight and stature, while obvious stigmata could be easily tabulated.

The most striking fact shown by these tables is the inferiority in physique of the Elmira inmates, as compared with Pontiac. The latter compare very well with the average urban population and still more favorably in these particulars with the artisan class of the larger English towns.[1] This is due to the fact that the degenerates and less active unskilled artisans of European cities locate on the sea border, while the stronger seek the interior or the country. The more apathetic emigrants of both urban and rural European communities are dragged into the cities.

[1] Roberts' Manual of Anthropology.

In considering the difference between the inmates of Elmira and Pontiac the fact should be remembered, that for several decades subsequent to 1850 New York State maintained the suicidal policy of having an establishment especially for emigrant defectives on Wards Island. At the end of five years residence the epileptic, hysteric, pauper, prostitute and semi-criminal classes were turned loose to drift into city institutions., or to remain in the city itself. The insane and idiotic were directly turned into the New York City institutions. The defectives less than five years resident in the United States were returned from other States to Wards Island, thus causing an undue accumulation of defectives in New York City. The mere existence of the Emigrant Refuge led to the settlement of the less energetic emigrants directly in New York City. The ordinary tendency of careless charity had its usual effect in increasing the defective population of New York City, and hence of increasing the number of defective youth.

The number at the younger age in Elmira is too few to be compared with the results of Bowditch, but so far as they go, compare favorably. The New York figures under-run Roberts' results at nearly all ages and in nearly all nationalities. The difference is more marked in weight than stature, while very apparent in the latter. The American figures indicate that the rush and roar of city life attract active degenerates from the country, the more apathetic urban degenerates remain in cities, while the more active press westward. In a general way, the comparison between Elmira and Pontiac tends to show that the more robust and restless of the degenerates as well as of the eastern rural population press westward. It is certain from the studies of the defective classes that apathetic defectives like paupers and prostitutes have less tendency to wander.[2] The more active defectives like the paranoiacs, periodical criminals, etc., have a tendency to wander. The influence of climate and soil has been too recently exerted to be demonstrable in the difference between New York and Illinois.

Table two shows the difference between the reformatories more strikingly than can be done by words alone. In it the average stature and weight, according to nationalities of inmates over 20 years of age, are given. This table includes the adult averages only. It is possible that the stigmata of lipomatosis has to be considered relative to the question of weight. The difference in weight between the two reformatories is particularly noticeable. The inmates of the eastern reformatory are generally a more slender type. In considering the question of lipomatosis the fact should be remembered that the cases admitting of this possibility are comparatively few, and the light individuals are much more numerous. The range in this particular is much more evident in Elmira than at Pontiac. As regards stature, the range was much greater at the latter place. It would be too strong a statement to claim the influence of western soil in this particular, as has been done by some criminal anthropologists. Data of comparison with the stature of the races are wanting.

The cephalic index is one of the most interesting of the anthropologic data. The results at both Pontiac and Elmira are summarized in table three. The marked dolichocephalic in both institutions is very noteworthy. As it contrasts with the marked mesocephaly of the populations from whence these crimi-

[2] Eighth Annual Report, Massachusetts Board of Health.

nals are drawn it is clearly a stigma of degeneracy. This is true even of the negroes, since in 2,000 examinations I found but 6 instances of dolichocephaly in Chicago. The Irish in Pontiac, and the Germans in Elmira, appear to be the least dolichocephalic, though their average index is decidedly below the lowest mesocephaly. In a general way this result tends to confirm the opinion expressed as to the proclivity of the apathetic foreign degenerate to remain on the seaboard. It is notorious that the more active Irish of the rural class go eastward. The more apathetic of the Germans remain in the seaboard towns. In no case could there be said to have been notable exaggeration of the racial type. It is unfortunate, however, that the cranial index of the districts from which these populations were drawn could not be obtained. Both Ireland and Germany are stilled dotted with dolichocephalic colonies.[3] The fourth table gives the breadth of the upper jaw measured from the outside of the first permanent molars and corresponding measurements from the second bicuspids. This will aid in giving an idea of facial proportions and average contours of the dental arches. The fifth table shows the variations in the height of the palatine vault. The width of the jaws between the molars and bicuspids of the four or five leading nationalities at Pontiac was decidedly in excess of the corresponding width at Elmira. This indicates that, notwithstanding the younger age, the face was wider and squarer than at the eastern institution. The Elmira measurements average less than those of normal individuals[4] in the Eastern States. The Pontiac institution's average equals, or even exceeds the normal figure. By this fact the impression that the emigrant of better physique goes westward is confirmed. The height of the palatine vault averages a little higher at Elmira than at Pontiac. This fact, taking into consideration the importance that has been attributed to the height of the vault as a stigma of degeneracy is of decided interest. The difference however between the average of the two reformaties is too slight to be of much value, even were it certain that height of the vault had the importance attributed to it. As compared with what may be considered the normal vault,[5] the average height in both Elmira and Pontiac may be considered under the normal, but much importance can not be attributed to the slight difference. The measurements of the width of the jaws, and of the height of the vault are, on the aggregate, of value, but their range above or below the normal not remarkable.

A series of measurements was taken between the eyes, measuring from center to center of the pupils, 2½ inches being the average. More accurate figures would have been obtained had the measurements been made between the inner and outer canthi. The variations between the reformatories themselves and between them and normal communities are not very striking.

The more accepted stigmata of degeneracy present striking facts in these institutions. It is advisable first to establish a normal standard, remembering that the average individual possesses degenerative stigmata to a minor degree, and that only combination and excess in a number of these mark the degenerate in the higher sense of the term. To furnish a normal standard a series of persons representing the average of the community was selected, and note taken of their stigmata, especially in the head and face. They were city residents of respectable standing, and were taken at random. The total number was forty-two; of these fifteen had subnormal, and seven excessive development of the occiput. Two had the bregma abnormally depressed; four had very low, and three receding foreheads; nineteen had an arrested, and seven excessive facial development; three had the nose sunken at alæ; twenty-six arrested, and three excessive, nasal development; one had the septum strongly deflected to the left; ten had abnormally small, and eleven very large orbital cavities, many of these also had the eyes sunken; four had V-shaped jaws; two partial V-, seven saddle-shaped and two semi-saddle-shaped jaws; six had irregular dentition; one hypertrophy, and one atrophy of alveoli; twelve had very large, and two abnormally small, development of the thyroid gland; not less than thirty-nine had one or more aural defects, either too large or too small, too widely or too closely set ears, adherent or excessive lobules, Darwin's tubercles, etc. Of the whole number there were only two with four stigmata each, one with five, six with six, seven with seven, six with eight, five with nine, four with ten, five with eleven, and four with twelve stigmata.

The average number of each individual was eight, and this may perhaps be accepted as approximately the normal figure, at least for the ordinary urban resident who does not belong to the defective classes.

Differences of opinion may arise in regard to the value of these defects as stigmata; yet, all elements of error considered, they furnish a fair method of comparison of the relative degeneracy of the respectable community and of the reformatory. Tables six and seven show that the stigmata of the average inmate of the reformatories are nearly double that of the average normal individual. In the New York institution the stigmata are double or more in nationalities of any number of those in the Illinois institution. The stigmata, hence, follow the same general rule as the physique. The inmates of the Illinois institution are noticeably less stigmatized by degeneracy than the New Yorkers. The native Americans of the New York institution presented an average of sixteen stigmata each. Those in Pontiac had only fourteen. While the difference was not so marked in the other nationalities, it was still sufficiently apparent. This corroborates the conclusion that the more defective degenerates remain on the sea border.

While stigmata other than those of the face and head were not considered in the studies for this paper at any length still the majority of the inmates were found to present an abnormal proportion of them. Marked bodily asymmetries, disproportion of members, flat feet, were more common than in the average normal population. Though reformatory inmates are usually considered as somewhat distinct from the ordinary population of the penitentiary, they present many of its physical characteristics. In this connection some recent studies of Dr. Charles E. Woodruff of Fort Custer, Montana, which are to form the basis of a work on degeneracy in regard to military service, are in point. Dr. Woodruff[6] remarks: "It is not often that criminals are enlisted, and the records, if gone over, will probably show that the number of crimes committed by soldiers is far less than those committed in any community among an equal number of young

[3] Taylor, Origin of the Aryans.
[4] Etiology of Osseous Deformities, 1894. [5] Idem, p. 74.
[6] Degeneration in Military Life.

men. If a city has 20,000 young men, say of ages from 20 to 35, it is quite possible that it has over 200,000 inhabitants, and I know of no city of that size where there are so few thefts and serious crimes as in the army. This should have been expected from the exclusion of the worst degenerates by the physical examination. A large number of common stigmata unfit the person for military service, and as criminals were believed to be physically below normal, this I made a personal test to determine. Through the courtesy of Superintendent R. W. McClaughry, of the Illinois State Reformatory, I examined 138 young convicts, just as I would recruits. I excepted the hearing and eye-sight, as these tests are subjective, and their notoriously untruthful answers could not be accepted. As eye and ear affections are known to be quite common, there would have been more disability for these troubles had time permitted of examination by objective methods.

"They were divided into the following classes:

"1. There were only two in whom there was no discoverable defects, there were two others with very trivial defects, and ten more who would pass but might be rejected by a careful surgeon; total, fourteen.

"2. In this class were placed those having minor defects sufficient to reject an unknown recruit, but which the surgeon himself would feel justified in overlooking if the man were very desirable (a good mechanic, clerk, etc.), or in the case of re-enlistment; total, thirty.

"3. In this class were defects so serious that the surgeon would not feel justified in overlooking, but would recommend that special authority be asked to enlist the man if he were extremely useful or were needed for special service, not in the ranks, or were needed in war; total, thirty-seven.

"4. Defects which would exclude in peace times, but would permit of special service, clerk, messenger, etc., in time of war, thirty-three.

"5. Totally unfit either in peace or war for special or general service, twenty-four. Total, 138.

"Several very boyish, immature men, evidently too young, were not included, nor were negroes. It must be remembered that these are the best grades of criminals in whom the judge believed there was chance for reform. Some of them are normal men who have been in bad surroundings, that is, they were taught to be criminals. The physical defects of confirmed criminals in penitentiaries are more marked, and from a very imperfect and casual examination of those in Joliet prison, I believed that very few were capable of military service.

"Then, again, quite a large number of criminals cease their active careers as executors of crime at the age of 25, or thereabouts, and then become contrivers of crime directing others,—they are the capitalists of crime, running brothels, saloons, become "fences," etc. Therefore, at the age at which the majority of men enlist in the army, the criminal is too actively engaged to think of enlisting. When one does slide in by oversight, it is surprising how quickly the soldiers of his company take measures to get rid of him. In some years the recruiting officers reject as many as 90 per cent. of the candidates for enlistment, only 10 per cent. being found up to the proper standard. In that 90 per cent. will be found the worst degenerates. It is rare to have more than 25 per cent. accepted.

"It is reported that forty newsboys were taken to the Brooklyn Navy Yard to enlist, and that thirty-eight were rejected as physically unfit[7]. This is to be expected when we reflect that these boys are thrust into the street as a result of parental degeneration, and must be degenerates of bad type and of markedly inferior physique. We have already called attention to the large number of criminals who have hernia (over 10 per cent.), tubercular history (perhaps 50 per cent.), and heart disease (25 to 50 per cent.), shortness of stature, underweight, defective senses and intelligence, and a restlessness incompatible with military discipline. From all the above facts I would make a rough estimate that 95 per cent. of confirmed criminals are physically unfit for military service.

"Knock-knee and flat-foot have not usually been considered stigmata but deformities due to mechanical changes, and sometimes due to perverted development of the bones. The conditions usually go together, for it is rare to find flat feet in bow-legged men. Flat-foot and knock-knee are much more common among degenerates than is generally supposed. In the 141 criminals I examined in Pontiac, there were the following deformities of all grades:

		Per cent.
Feet and knees normal	67	47.5
Knock-knee alone	14	10.0
Flat-foot alone	34	24.1
Knock-knee and flat-foot combined	22	15.6
Very bow-legged	1	.7
Bow-legged and flat-foot	3	2.1
	141	100

"From the lack of resistance of degenerate structures one should be prepared to find, therefore, that more than half of these men should present anomalies of the feet and knees. I have very frequently been astonished at the high degree these deformities assumed in undesirable recruits. I kept no record of the number of the above cases in which the deformity was of sufficient grade of itself to unfit for military service.

"Ancient statuary is remarkable for the number of flat feet in which the arch is in various grades of destruction. Ancient models must have been very poor to cause the artists to copy this condition so often.

"As a mild form of knock-knee is a normal feminine characteristic, we find it well marked in cases of femininism. The mild grades of flattened feet in women are also in part normal, and follow quite naturally both from the normal knock-knee and the naturally weak tissues. Both conditions in males may then be a result of femininism. The infant's foot is normally flat, and so is the negro's, and its retention in adults may be atavistic. In the Elmira Reformatory, of 529 men examined, the arch of the foot appeared to be normal in 58.42 per cent., unnaturally low in 18.71 per cent., and flat in 22.87 per cent.

"Faulty position of the foot may be produced by an anomalous position of the ends of the long bones of the leg and thigh. The toes may be thrown far out, causing a shuffling gait, as though the man walked on his heels, or the toes may be turned in. In civilized man the feet make an angle of about 30 to 45 degrees but in many savages it is a smaller angle, or, indeed, the feet may be parallel.

"All the above states of the knees and feet must not be considered stigmata, as they are not always due to unstable development; but they must be given weight as indicating faulty developments of the tissues, a

[7] Medical News, June 20, 1897.

TABLE 1.—Averages of stature and weight according to age and nationality of the inmates of the Illinois State Reformatory at Pontiac, Ill. Stature given in inches, weight in pounds.

Age.	Americans.			Germans.			Irish.			Africans.			Jews.			Polish.			English and Canadians.			French.			W. Indian and Mexican.			Dutch.			Scandinavian.			Greek.			Slavonic, Bohemian, Russian.			Swiss.			Italian and Spanish.			Hungarian			Scotch.		
	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.	No.	H.	W.
15	2	65	105																																												
16	1	66	109	1	68	121	1	66	121	1	66	109				1	61	120	4	65	122	2	65	140																							
17	15	65	121	15	64	116	30	64	119	3	67	127	7	67	127	1	66	125	7	68	130	7	66	135																							
18	19	63	121	30	64	116	30	64	123	7	67	127	9	67	137	2	66	138	13	68	129	5	65	139																							
19	32	64	123	26	65	125	90	65	128	9	65	138	13	68	143	3	66	138	9	68	135	6	65	139																							
20	39	65	122	28	65	128	90	65	131	8	66	138	8	66	140	3	66	138	8	66	138	4	66	138																							
21	32	65	126	25	66	130	117	66	133	8	66	143	6	66	141	5	66	143	8	66	143	4	66	142																							
22	23	65½	126	19	66	134	83	66	135	6	66	145	8	66	145	3	66	139	8	66	142	3	66	142																							
23	20	66	129	15	66	132	83	66	143	4	66	139	3	67	153				6	66	146	2	66	142																							
24	17	66	136	11	64	129	54	66	146	1	68	158							3	66	146	1	68	140																							
25	9	64	128	5	67	137	24	67	158	1	68½	150½	1	68	150																															
26	5	66	137	2	63	121	13	65	120	1	64	123																																			
27	7	67	141	1	64	134	4	64	125																																					
28	4	64	134	1	65	154	1	66	150																																					
30	6	67	149																																											
Averages of stature and weight according to age and nationality of the inmates of the New York State Reformatory at Elmira, N. Y.	16	1	66	109																																										
17	15	65	121																																										
18	19	63	121																																										
19	32	64	123																																										
20	39	65	122																																										
21	32	65	126																																										
22	23	65½	126																																										
23	20	66	129																																										
24	17	66	136																																										
25	9	64	128																																										
26	5	66	137																																										
27	7	67	141																																										
28	4	64	134																																										
30	6	67	149																																										

TABLE 2.

Nationalities.	Illinois State Reformatory.			New York Reformatory.		
	Number.	Stature.	Weight.	Number.	Stature.	Weight.
Americans	59	66.18	145.5	166	65.69	128.24
Germans	36	65.5	141.1	130	65	119.84
Africans	28	65.8	141.1	32	65.28	132.9
Irish	47	65.88	142	209	65.2	130.4
English	14	65	138.42	41	64.97	127.29
French	6	66	149	16	64.7	134.38
Bohemian	6	66.67	142	4	64.87	124.25
Scandinavian.	5	69	164.2	4	67.75	132.75
Scotch	3	65	150	18	65.88	130.5

This table is intended to give only the adult averages.

TABLE 3.—CEPHALIC INDEX.

Nationalities.	Illinois State Reformatory.			New York State Reformatory.		
	Max.	Min.	Ave.	Max.	Min.	Ave.
American	80	61	72.8	79	66	73+
German	79	62	72	84	68	74
German Jew	71	. .	71	. .	. .	. .
Irish	81	68	74	86	68	73
African	71.5	59.5	71	77	68	73+
English	77	68	73	77	68	72+
French	77	71	73	75	68	73+
Polish	76	71	73.3	75	71	74
Swede	74	68	71	74	71	72
Norwegian	77	71	73	74	. .	74
Danish	71	. .	71	77	74	75+
Indian	73	. .	73	. .	. .	. .
Greek	71	. .	71	. .	. .	. .
Mexican	71	. .	71	74	71	72+
Bohemian	81	71	74	77	70	72+
Swiss	74	. .	74	74	71	72+
Scotch	74	73	73	80	68	71+
Spanish	. .	. .	. .	77	68	72+
Jew	76	73	74	84	71	72+
West Indian	. .	. .	. .	78	. .	78
Italian	. .	. .	. .	77	68	70+
Russian	. .	. .	. .	68	. .	68
Hungarian	. .	. .	. .	80	78	76+

TABLE 4.

Nationalities.	Illinois State Reformatory.						New York State Reformatory.					
	Greatest width outside 1st perm. molar.	Least width outside 1st perm. molar.	Average.	Greatest width outside 2d bicuspid.	Least width outside 2d bicuspid.	Average.	Greatest width outside 1st perm. molar.	Least width outside 1st perm. molar.	Average.	Greatest width outside 2d bicuspid.	Least width outside 2d bicuspid.	Average.
American	2.75	1.75	2.19	2.25	1.84	1.98	2.50	1.75	2.09	2.87	1.12	1.82
German	2.50	1.84	2.25	2.25	1.95	1.91	2.75	1.75	2.16	2.25	1.12	1.88
German Jew	2.25	2.25	2.25	2.25	2	2	. .	. .	. .	. .	. .	. .
Irish	2.75	1.75	2.18	2.84	1.84	.97	2.75	1.75	2.12	2.37	1.12	1.90
Negro	2.75	2	2.30	2.20	1.36	1.95	2.50	2	2.17	2.25	1.75	1.96
English	2.25	2	2.17	2.12	1.84	1.93	2.50	1.75	2.15	2.12	1.50	1.85
French	2.75	2	2.20	2.12	1.84	2	2.75	1.75	2.18	2.12	1.50	1.91
Pole	2.25	2.36	2.30	2.25	1.84	2.06	2.75	2.12	2.24	2	1.87	1.94
Swede	2.75	1.50	2.20	2.36	1.84	1.93	2.25	2.12	2.20	2	1.50	1.79
Indian	2.36	2.36	2.36	2		2	. .	. .	. .	. .	. .	. .
Greek	2.25	2.25	2.25	2		2	. .	. .	. .	. .	. .	. .
Mexican	. .	. .	. .	. .	. .	. .	2.12	2	2.12	2.12	1.87	1.87
Bohemian	2.75	2.10	2.25	2.12		1.88	2.25	1.87	2.01	2	1.50	1.81
Norwegian	2.75	2.36	2.45	2.25		2.09	2.25	2.25	2.25	2	2	2
Swiss	2.25	2.25	2.25	2.25	1.84	1.84	2.25	2	2.12	2.18	2	2
Danish	2.25	2.25	2.25	2	2	2	2.25	1.75	2	2.08	1.50	1.75
Scotch	2.36	1.75	2.17	2.12	1.75	1.87	2.50	2	2.12	2	1.75	1.47
Spanish							2.37	2	2.02	2.12	1.75	1.91
Jew	2.50	2.50	2.50	2.36	2.36	2.12	2.87	1.75	2.16	2.12	1.50	1.73
West Indian							2.25	2.25	2.25	2.12	2.12	2.12
Italian							2.50	1.87	2.15	2.12	1.12	1.90
Russian							2.12	2.12	2.12	1.87	1.87	1.87
Hungarian							2.25	2	2.15	2.12	1.75	1.93
Dutch							2.25	1.75	2.12	2	1.50	1.82
Turk and Tyrol							2.25	2.25	2.25	2	2	2
Roumanian							2.12	2.12	2.12	1.87	1.87	1.87
Canadian							2.25	1.75	2.07	2.20	1.75	1.82

degenerate characteristic. It is quite likely that the fault is rickets, which recent investigations have proved to be almost the rule in degenerate children."

There can be no doubt that similar systematic research would reveal among the older criminals in the States prisons an exceedingly large proportion of

degenerates, as, indeed, incidental research has shown. There have, however, been very few systematic studies of the younger criminal as a class, or of those who for various reasons have been found by judges better suited for reformatories than true penal establishments. The few examinations that have been made were generally of a more juvenile class than that here considered, and hence not well suited for the study of stigmata. The notes on the stigmata involved a greater number than are represented in the other tables. This, as has already been explained, was due to the measurements being made by others. There is no doubt however as to their substantial accuracy.

No attempt was made at systematic craniometric data, the chief aim of the observations having been to note the facial stigmata. In a general way, some more striking cranial deformities are noted; the excessive, or otherwise, occipital or bregmatic prominence, and the relative height of forehead. The most notable peculiarity in these respects is the large proportion of cases of pronounced height of the bregma, more observable in the inmates of the New York State Reformatory than at Pontiac. While not pronounced enough in all cases to result in true oxycephaly, the tendency was in that direction. This fact is in accord with observations elsewhere on the criminal classes. The excess of development in the occipital region was likewise more common in the Elmira inmates, whose proportion of average normal heads was less than that of the western institution.

TABLE 5.

Nationalities.	Illinois State Reformatory.			New York State Reformatory.		
	Greatest height of vault.	Least height of vault.	Average.	Greatest height of vault.	Least height of vault.	Average.
American	.63	.44	.49	.75	.50	.54
German	.75	.42	.50	.75	.50	.52
German Jew	.62	.50	.50	. .	. .	. .
Irish	.62	.50	.56	.75	.50	.54
Negro	.62	.50	.52	.87	.50	.76
English	.62	.50	.55	.75	.50	.58
French	.62	.50	.55	.75	.50	.53
Pole	.62	.50	.52	.62	.50	.54
Swede	.60	.50	.52	.62	.50	.58
Indian	.60	.60	.60	. .	. .	. .
Greek	.62	.62	.62	. .	. .	. .
Bohemian	.62	.50	.51	.50	.41	.48
Norwegian	.62	.50	.54	.62	.62	.62
Swiss	.62	.62	.62	.50	.50	.53
Danish	.62	.62	.62	.75	.50	.62
Scotch	.62	.44	.57	.62	.50	.54
Jew	.56	.50	.54	.75	.50	.54
West Indian	. .	. .	. .	.50	.50	.50
Mexican	. .	. .	. .	.62	.52	.57
Italian	. .	. .	. .	.62	.50	.57
Spanish	. .	. .	. .	.75	.41	.63
Russian	. .	. .	. .	.50	.50	.50
Hungarian	. .	. .	. .	.72	.50	.59
Dutch	. .	. .	. .	.75	.50	.58
Turk	. .	. .	. .	.50	.50	.50
Tyrol	. .	. .	. .	.62	.62	.62
Roumanian	. .	. .	. .	.62	.62	.62
Canadian	. .	. .	. .	.75	.50	.58

TABLE 6.—Number of stigmata of degeneracy of entire body, in the Illinois State Reformatory.

No. of stigmata.	American.	German.	Negroes.	Irish.	Jew.	Polish.	English.	French.	Indian.	Swede.	Greek.	Mexican.	Bohemian.	Norwegian.	Swiss.	Danish.	Scotch.	Dutch.
9	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	1	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14	3	.	5	3	.	.	1	.	.	.	.	.	.	.	.	.	.	1
15	3	2	5	.	.	.	1	2	.	.	.	.	.	.	.	.	2	.
16	4	1	6	3	.	.	1	2	.	.	.	.	.	.	.	.	.	.
17	9	1	1	5	.	1	2	1	.	.	.	.	.	.	.	.	.	.
18	11	13	8	12	.	1	2	1	.	.	.	.	1	.	.	.	1	.
19	24	10	8	13	2	3	4	.	.	3	.	.	.	1	.	.	.	.
20	18	12	6	9	.	3	6	1	.	3	.	.	.	.	.	1	.	1
21	28	11	8	10	.	1	3	3	1	1	1	.	.	1	.	.	.	.
22	11	8	3	15	.	1	4	1	.	.	.	1	1	.	1	.	.	.
23	4	4	1	10	.	.	.	.	.	.	.	.	1	.	.	.	.	.
24	2	.	1	5	.	.	1	1	.	1	.	.	.	1	.	.	.	.
25	2	2	.	2	.	1	.	.	.	.	.	.	.	.	.	.	.	.
26	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.
28	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Aver.	22.1	19.7	17.	21.8	19.	20.	18.5	18.6	21.	21.	21.	22.	21.	21.	22.	22.	18.7	18.8

TABLE 7.—Number of Stigmata of Degeneracy of Entire Body in the New York State Reformatory.

No. Stigmata.	Americans.	Germans.	Negroes.	Irish.	Jew.	Polish.	English.	French.	Indian.	Swede.	West Indian.	Mexican.	Bohemian.	Norwegian.	Swiss.	Danish.	Scotch.	Dutch.	Turk.	Roumanian.
9	1	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10	16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12	22	2	1	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
13	30	2	3	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
14	45	3	3	2	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
15	46	4	5	3	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.
16	86	6	6	4	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.
17	57	11	13	5	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.
18	25	6	4	3	.	.	1	.	.	.	.	.	.	.	.	.	.	.	.	.
19	10	3	2	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
20	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Average	16	18	8	17	19	17	7	20	15	19	20	17	20	19	22	21	7	21	17	18

No. Stigmata.	Hungarians.	Russians.	Spanish.	Italian.	Danish.	Swiss.	Norwegian.	Bohemian.	Mexican.	Greek.	Indian.	Scotch.	Dutch.	Turk.	Roumanian.
9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1
10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16	20	2	1	3	.	.	.	.	.	.	.	.	.	.	.
17	7	1	1	6	1	.	.	.	.	.	.	.	.	.	.
18	15	1	1	8	1	.	.	.	.	.	.	.	.	.	.
19	15	1	1	8	1	.	.	.	.	.	.	.	.	.	.
20	19	2	1	9	1	.	.	.	.	.	.	.	.	.	.
21	9	1	1	5	1	.	.	.	.	.	.	.	.	.	.
22	5	1	1	3	1	.	.	.	.	.	.	.	.	.	.
23	2	.	.	1	.	.	.	.	.	.	.	.	.	.	.
24	1	.	.	1	.	.	.	.	.	.	.	.	.	.	.
25	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
27	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
28	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Average	18	17	21	20	22	22	21	21	21	21	21	22	21	17	18

As regards the face, the tendency seems to be more commonly toward an arrested than an excessive development, especially at Pontiac, where a fairly normal facial contour is more common. The height or prominence of the zygoma claimed as a criminal feature was most common in Pontiac. There was no predominance of unusually large orbits (as described by Lombroso) in either place. A diminished orbital capacity was the rule, and in Elmira deep sunken eyes were in the majority. Nasal development of moderate degree was the exception at Elmira, but the rule at Pontiac. In the more particularly known mandibular deformities, the results were striking. Well formed or normal jaws were decidedly in the minority. The proportion of abnormalties (V-shaped, partial V-shaped, semi-V-shaped, saddle-shaped, partial saddle and semi-saddle) was excessive in both reformatories, (63 per cent. at Pontiac, and 60 at Elmira). These deformities, common in criminals, by the flaring out of the posterior portion of the lower jaw, contribute to the square lower face in the criminal physiognomy. The teeth were only in a moderate proportion affected by irregularities aside from those connected with deformities of the jaw. The same is true of alveolar

abnormalities. In both respects the inmates were fairly normal, and as regards regularity of dentition, were rather better than the average. The types of aural stigmata have been discussed in my paper on "The Degenerate Ear."[8]

TABLE 8.

	Occipit.	Occipit.	Bregma	Bregma	Forehead.	Forehead.	Develop'm't.	Develop'm't.	Zygomata.	Zygomata.	Width.	Width.	Length.	Length.	Develop'm't.	Develop'm't.	Develop'm't.	Develop'm't.
	Atrophied.	Excessive.	Normal.	High.	Low.	Receding.	Atrophied.	Medium.	High.	Medium.	Low.	Sunken at side.	Broad.	Narrow.	Long.	Short.	Medium.	Excessive.
Illinois State Reformatory	283	81	127	549	110	295	285	138	386	121	54	128	185	358	263	171	69	4
New York State Reformatory	412	496	105	952	89	646	206	90	586	116	419	421	610	189	689	601	751	375

	Jaws.	Jaws.	Jaws.	Jaws.	Jaws.	Jaws.	Teeth.	Teeth.	Teeth.	Alveolar Process.	Alveolar Process.	Alveolar Process.	Thyroid Gland.	Thyroid Gland.	Arms.	Arms.	Hands.	Hands.	Hands.	Hands.	Legs.	Legs.	Feet.	Feet.	Feet.
	V-shaped.	Partial V.	Semi-V.	Saddle.	Partial saddle.	Semi-saddle.	Normal.	Irregular.	Tubercles.	Normal.	Hypertrophy.	Atrophy.	Normal.	Excessive.	Atrophied.	Short.	Long.	Short.	Long.	Right-handed.	Left-handed.	Short.	Long.	Large.	Small.	Medium.
Illinois State Reformatory	75	71	8	69	93	16	171	642	111	1258	98	1	195	171	196	327	327	387	626	424	41	257	190	175	360
New York State Reformatory	380	49	1	197	95	.	422	321	1015	1068	74	.	106	969	382	659	659	393	659	964	47	959	396	892	695

The percentage of deformities of this kind is rather under that observed in the non-criminal population. The size of ears was not very extraordinary. This may perhaps be due to the age of the patient, since growth of the ear is more or less continuous throughout life. The most striking peculiarity found among the juvenile criminals was the number of ears set at obtuse angles to the head, which has been noted as a criminal peculiarity by Frigerio. Although a very small number (about 1 per cent.) had very long ears, still this percentage was a large one considering the average age of the persons examined, and therefore merits attention since it may be an evidence of premature growth so common in the defectives. A notable peculiarity at Elmira was the prominence of the thyroid present in nine-tenths of the inmates. In this the lesser development of the fleshy tissues played a part. The prominence included both the gland and the thryoid cartilages. At Pontiac there was nothing noticeable in this respect. The arms and legs were more excessively developed at the Pontiac institution. As a large proportion of the Pontiac inmates were otherwise well developed, this excessive development was evidently a stigma of the atavistic criminal type.

Complexion and color of eyes and hair was noted in each (Table 9) institution, those of negro descent being excluded from consideration. Decided blonds furnished about 12 per cent. of the inmates of Elmira, and 11 per cent. of those of Pontiac. The great majority were neither blond nor brunette, but had hair of varying shades of brown. An overwhelming majority had gray or blue eyes. Black eyes were in the minority. Decided red hair was uncommon, but most frequent in Elmira (about 1 per cent.).

The table (Table 10) giving statistics of crimes reveals no very striking difference other than accountable by the differing methods of the courts of the two States. The small proportion of pure crimes of violence (about 5 per cent. at Pontiac and very little more than that at Elmira) indicates that crimes of passion were the exception, and that those offenders were more truly criminals than might have been expected from their status as reformatory inmates. As to the extent of their responsibility and reformability, it must be remembered that degeneracy predisposes the majority to become easy victims of vicious tendency. Juvenile, moreover, when not of purely infantile type, is apt to be precocious criminality. As pointed out by Ferri, it is an indication that the individual falls rather into the class of "born criminals" (in Ferri's sense) than into that of the occasional type. The occasional crime, Ferri remarks, and the crime of passion do not occur, as a rule, before manhood, and rarely or never lead to relapse. In other words, there are the slips of conduct in an individual who has developed normally in the main. These reformatory inmates, as a class, have the potentialities of the habitual criminal, of which it is the aim of the institution to prevent development. They are the victims of environment, it is true, to a certain extent, but far more than is commonly supposed or admitted by philanthropists and reformers, are the victims of heredity. Every form of ancestral malnutrition and vice has undoubtedly played its part in their development. The results of my inquiry, so far as it has proceeded, may be summed up as follows:

The inmates of these two State Reformatories are, in the vast majority, of the degenerate class. Their physical stigmata are more than twice as numerous as those in non-criminal individuals. This is true in the particulars noted in the present inquiry. From Dr. Woodruff's results it is evident that further increase of the scope of the inquiry would have increased rather than lessened this proportion.

The very perceptible difference between the inmates of the two institutions as regards the degree of degeneracy shown in the number of stigmata presented is due to the causes already pointed out, and especially to the suicidal policy of New York State having so long maintained the pauperizing Emigrant Refuge. Here, as has already been pointed out, the defective classes of the European countries were deliberately

[8] Journal of the American Medical Association, Vol. XXVII.

TABLE 9.—Aural measurements and variations.

	LENGTH.							WIDTH.							HELIX.				ANTI-HELIX.			
	19/32	20/32	21/32	22/32	23/32	24/32	25/32	7/32	8/32	9/32	10/32	11/32	12/32	13/32	Root.		Form.		Development.			
															Abnormal.	Normal.	Open.	Medium.	Arrested.	Medium.	Excessive.	
Illinois State Reformatory	1	18	6	5	90	248	83	16	2	1	66	165	17	221	45				286	55	174	181	48	295	527	398	195	270
New York State Reformatory		15	3	4	205	682	118	17		1	34	170	155	603	70	3			771	62	306	294		747	907	134	317	722

	TUBERCLES OF DARWIN.			LOBULE.					TRAGUS.			ANTI-TRAGUS.			CONCHA.			ANGLE.			RELATION.		
	Middle third.	Upper third.	Lower third.	None	Attachment.			Shape.			Development.			Development.			Development.			Close.	45 degrees.	Right.	Right, higher.	Left, higher.	Normal.
					Close.	Medium.	Separate.	Broad.	Narrow.	Long.	Arrested.	Medium.	Excessive.	Arrested.	Medium.	Excessive.	Small.	Medium.	Large.						
Illinois State Reformatory	Right. 198	Right. 70	Right. 2	367	309	163	19	334	194	33	255	22	198	310	39	76	125	305	22	198	152	115	51	191	921
	Left. 309	Left. 82	Left. 1	701	831	191	19	671	361	35	451	25	513	693	21	316	396	118	657	285	567	187	1	2	1098
New York State Reformatory	Right. 198	Right. 107	Right.																						
	Left. 309	Left. 285	Left. 47																						

TABLE 10.—Crime.

	Illinois State Reformatory.	New York State Reformatory.
Burglary	263	499
Larceny	154	. .
Murder	8	2
Rape	3	10
Assault to kill	10	. .
Forgery	12	65
Grand larceny	12	309
Arson	1	4
Abduction	1	2
Malicious mischief	1	2
Violation of postal laws	2	4
Perjury	1	2
Horse stealing	2	. .
Confidence game	1	. .
Assault	. .	42
Crime against nature	. .	1
Robbery	. .	68
Manslaughter	. .	2
Bigamy	. .	6
Receiving stolen goods	. .	16
Possession of counterfeit certificate	. .	1
Violation of election laws	. .	2
Embezzlement	. .	2
Obstruction on railroad	. .	2
Attempt to escape from prison	. .	2
Unlawful marriage	. .	1

selected out to form the population of New York State, while the other States received the more robust and less degenerate members. In addition to this, the attraction of a large city naturally held the weaker members of the emigrant community, while the stronger tended away from the sea-board.

While many of the special peculiarities claimed by various authors as characteristic of the criminal class were found, still there was no such predominance of any one or more of these features that would justify the creation of a criminal type as shown by particular and generally manifested features. The sole conclusion to be drawn in this particular is, that these younger criminals belong to the degenerate class, and are so handicapped by hereditary defects that they fall ready victims to criminal tendencies and environment.

ANTERIOR PILLARS OF THE FAUCES, THEIR ABNORMALITY, ETIOLOGY AND TREATMENT.

Presented in the Section on Stomatology, at the Forty-eighth Annual Meeting of the American Medical Association, held at Philadelphia, Pa., June 1-4, 1897.

BY GEO. T. CARPENTER, M.D., D.D.S.

PROFESSOR OF ORAL SURGERY COLUMBIAN DENTAL COLLEGE; INSTRUCTOR IN NOSE AND THROAT DEPARTMENT, COLLEGE OF PHYSICIANS AND SURGEONS, CHICAGO, ILL.

The anterior pillars are in my judgment, and from observation, disputed ground, belonging both to the oral surgeon and the laryngologist, but receiving little attention from either. The faucial arches are covered with mucous membrane. The anterior pillars are formed by the palato-glossus muscles. The blood supply comes from a branch of the descending palatine artery and is returned by the inferior palatine vein from a plexus surrounding the tonsil, and from the pillars and soft palate into the deep facial vein. The nerves are from the descending branch known as the small or posterior palatine nerves, which are conducted to the pillars, tonsil and uvula. The membrane, which is visible from the mouth, is thinner and slightly redder than that of the hard palate; but like it, is covered with a scaly stratified epithelium. The margins of the pillars are covered with the same epithelium. The posterior and upper surfaces are covered with ciliated columnar epithelium. Lymphatics are abundant on these surfaces and numerous small compound glands form almost a complete layer under the mucous membrane. Lymph follicles are true lymphatic apparatus whose juices and lymph corpuscles can pass into the nearest lymphatics. Great numbers of leucocytes continually pass out between the epithelial cells covering these follicles, through which, under certain conditions, microbes and other poisonous substances may enter.

It is not my purpose in this short paper to discuss the diseases in general that affect the fauces, such as syphilitic or ulcerative conditions, but it is the dark red, or reddish blue color which is a venous stasis of the pillars and uvula and their shining sticky mucous surfaces that I wish to consider.

I find that in a large number of patients visiting my office for dental services, this abnormal condition is present. These parts are easily brought to view by having the patient breathe through the mouth. The patients do not complain of sore throat but of a fetid breath, and sometimes of a disagreeable taste in the mouth. The condition of the teeth and gums (in the

absence of an erupting or impacted third molar) in many cases does not furnish cause for the existing condition of the fauces. The patient has not applied to a laryngologist but to a dental, or oral surgeon, and it is his opportunity to put the mouth in a healthy condition; I think it is his duty to have suitable instruments so as to make a proper diagnosis, and either give proper treatment or direct the patient where he can receive the same. The venous stasis of the pillars acts as a sentinel, the etiology of which, if not in the erupting molar, will be found either in the tonsil or post nares. The tonsil may have little or no inflammatory action and the crypts may or may not be filled with a cheesy exudate, and still their sluggish condition will produce foul smelling secretions, and absorption by the lymphatics will follow. Also stenosis and chronic catarrhal conditions of the post nares will produce a dropping in the pharynx and keep the pillars bathed with a foul secretion which will taint the breath and produce, through absorption, an abnormal appearance of the pillars. Frequent attacks of coryza which do not receive treatment, and are allowed to become chronic, produce the same result and thus become etiologic factors.

The treatment consists in antiseptic gargles, of which borolyptol, either in full strength, or diluted, is one of the best; also an alkaline and antiseptic wash, as Dobell's solution used as a gargle or spray for the throat, and spray for the nose. The tonsillar condition may be stimulated with nitrate of silver, grams 3.9 or 7.8 to aqua c.c. 30, or the electric cautery can be used to advantage. When the catarrhal conditions exist, any stenosis should be corrected, and the nares and fauces cleaned night and morning with an alkaline spray. In addition to this, two or three times a week, the iodin solution, grams 0.13 to 0.65 of iodin to the 30 c.c. of water with iodin of potassium and glycerin, will be found advantageous. I have found great satisfaction in the treatment of this affection as the condition is always improved, if not entirely cured.

TRACHEOTOMY IN DIPHTHERIA IN CONJUNCTION WITH ANTITOXIN.

Read before the Missouri State Medical Association, May, 1897.

BY E. VON QUAST, M.D.

SURGEON TO GERMAN HOSPITAL AND HEALTH OFFICER, KANSAS CITY, MO.

Of all diseases of childhood, laryngeal diphtheria or membranous croup is the most dreaded. Either the larynx is primarily the seat of affection or is secondary to tonsillar diphtheria. Sometimes the affection in both organs is simultaneous, or the post nares or tonsils have had a deposit which so rapidly spread to the larynx that the primary seat of infection was overlooked by parents until threatened asphyxiation called their attention to the fact that their darling was in danger and they sent post haste for medical aid. Whether the cause of membranous croup was identical with that of diphtheria or not, was for years a bone of contention in medical ranks. Volumes were written on the subject and differential diagnosis was a bugbear to the general practitioner. Gradually the profession became divided; one side believed in the duality of the disease and the other in the unity; and discussions *pro* and *con* were heard at meetings of medical societies in this and the old country. Infectiousness of true croup was doubted by a large and influential body of men, while others were firm believers in it, and only since bacteriology has thrown light on the subject and proven in the majority, if not in all, cases, the presence of the Klebs-Loeffler bacillus in the membranes and exudates, has the band of doubters been reduced to a very small body. It is to be hoped that soon the term "croup" and "membranous croup" will cease to exist in medical literature, cease to be posted in our cities as such, and cease to appear in our death reports; but simply be classified as diphtheria. Remedy after remedy for the treatment of membranous laryngitis was introduced, tried and extolled, but the death-rate remained enormous, even with tracheotomy, and soon it was condemned by a great number of the profession. O'Dwyer's tubes were hailed with delight by many operators, but even with their use the death-rate remained too high. This operation found more favor with the laity, while the profession used it more readily because the objections to the surgeon's knife were too great in many cases.

Intubation, universally used, failed to be the boon its champions claimed. Without discussing the merits or demerits of this operation, I will frankly state that I prefer tracheotomy as long as it gives the percentages of recoveries that I have had, both before and after the discovery and use of antitoxin in the treatment of this disease. Even before the introduction of antitoxin, my success in this operation was all that could be expected. It was not due to a selection of cases nor to a better understanding of the operation, but to the fact of its timely performance and the exercise of diligence in the after-attention and care of the patient. To do tracheotomy only as a *dernier ressort* is a grave mistake, for the vital forces of the child have been exhausted from the non-aeration of the blood. Still, I have met with success in two cases after sensation had ceased, by quickly opening the trachea and introducing a full sized tube, and performing artificial respiration. Breath and air is what is wanted at this critical moment. Minutes are hours and delay means death. Generally speaking the golden rule for performing tracheotomy is whenever dyspnea with cyanosis has manifested itself—the respiration murmur is faint or absent, with retraction of the chest wall, the attacks of extreme dyspnea becoming more frequent. Delay under such circumstances would be disastrous. The introduction of antitoxin into therapeutics marks a new era in the treatment of this affection.

In November, 1894, I read a paper on Antitoxin before the Jackson County Medical Society, by request, having closely followed the literature on the subject since 1890. A committee was appointed at the time, by the above named society, to investigate the use and action of the antitoxin, and a quantity was procured by the board of health. I was a member of this committee, and watched closely the effect of this remedy. At the end of a few months we gave a complete and unbiased report of our work. As usual with all new remedies, enthusiasm ran high in some quarters, while in others antitoxin was condemned as a fad and its use said to be dangerous. Now, after two years trial, enthusiasm has given way to sober judgment and it has received its place in therapeutics, has won friends and admirers in quarters where it was first bitterly opposed.

I believe that every unprejudiced physician must reach the positive conclusion that it is a valuable remedy and predict that the time will come when the

refusal to use this remedy in diphtheria in children will be regarded as criminal. It is to be regretted that it is not used by all physicians in these cases, and that there are still so many reports of death from membranous croup, where antitoxin, tracheotomy or intubation have not been used, children were allowed to suffer the horrible death of asphyxiation. Antitoxin is not a cure-all. Its early administration in membranous croup offers the best hopes of preventing the extension of infection, causes softening of the membrane and prevents septic infection. Frequently, indeed, it does away with the necessity of operative interference.

Reports from members of pediatric societies bear out the statement that, until the use of antitoxin, they had seen no case of recovery from membranous croup; and men of well known reputation have stated that by its use operations become less frequent. (O'Dwyer and Northup.)

A complete report of the New York Health Board shows that the mortality for operative cases has been reduced one-half as the result of serotherapy. To produce a satisfactory result in these instances, being the gravest of all forms of diphtheria, it must be given in very full doses. There is one great danger, however, in the loosening of membranes in large masses which are liable to obstruct the larynx or trachea and produce sudden asphyxiation. On this account the physician must not leave his patient until he is sure the membranes have come away, respiration is restored to a normal condition, and all signs of obstruction and cyanosis have passed away. If no improvement follows, no air enters the lungs, and thoracic breathing continues with a dusky or very pale countenance and a slow, weak pulse, it is better to do a tracheotomy at once than to wait for possible relief. By following this rule, I have, within the last ten months, performed five successive tracheotomies without a single death. The youngest of these children was $3\frac{5}{6}$ years, the others between 6 and 7 years of age. In two, intubation was performed first; in one, intubation, followed by an immediate tracheotomy; in the other, two days of respite were given; in the remaining three tracheotomy was immediately required. Three of these operations were done in three weeks. All but one were treated with antitoxin before the operation, one afterward; first dose administered immediately after the operation. All recovered without any paralysis or bad symptoms. The tube was worn from five to ten days, being removed as soon as air could freely pass through the larynx, and the wound allowed to heal by granulation. Very close attention was paid to the steps of the operation. In two cases chloroform could be administered safely; in the others it would have been dangerous. Strychnia was administered hypodermically in all but one case to stimulate respiration. Strict attention was paid to the after-care of the tube; the frequent removal and cleansing was ordered in every case where any sign of obstruction was noticed. This, together with keeping the tube moist if necessary, by the dropping of sterilized water into it, is the sheet-anchor of success in the operation. No medical treatment, except the use of strychnia, was given in these cases. The children were permitted to partake of wholesome and sufficient liquid nourishment with, occasionally, some stimulant. In all but one case the parents or near relatives did the nursing and performed it well. Such cases must never be left out of sight until all alarming symptoms have disappeared. The whole tube was removed once every day by myself, the trachea examined, loosened membranes removed and the wound cleaned before the re-introduction of the tube. In all, cultures were taken from the detached membrane and the presence of Klebs-Loeffler bacillus demonstrated.

AN IMPROVISED APPARATUS FOR FIXING BLOOD-FILMS AT EXACT TEMPERATURES.

BY L. BREMER, M.D.
ST. LOUIS, MO.

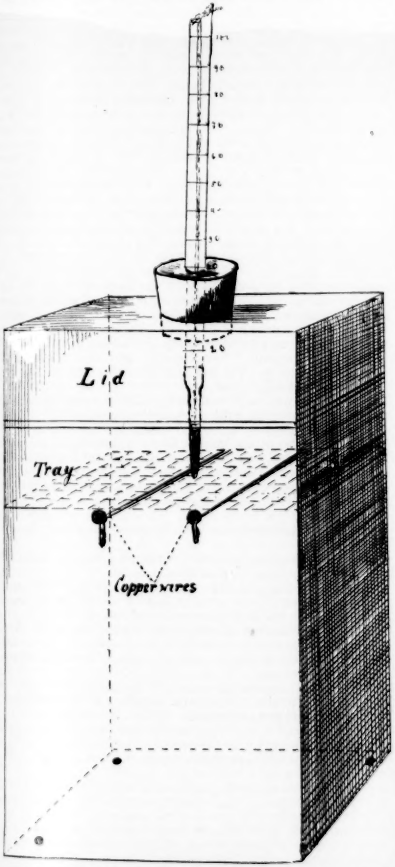
The greatest of the many difficulties attending and complicating the study of hematology is the recognition and interpretation of the artefacts. Being a fluid, the blood with its corpusclar elements is more vulnerable than the rest of the tissues. This vulnerability manifests itself in response to mechanical and chemic injuries produced on the plasma, but especially the corpuscular elements in the course of the several modes of hardening or fixing the blood-film preparatory to the staining process.

Different methods, however slight the difference may be, will yield different pictures owing to the delicacy of the selective affinities of the constituent elements of the blood-corpuscles. By using chemicals such as alcohol, ether, or formol, as hardening agents, an element of uncertainty is introduced rendering results unreliable and ambiguous because of the possibility of existing impurities or variations in the percentage of water. The ideal hardening method is by heat. The disadvantage of this procedure has been the variableness of the heat degrees when Ehrlich's copper plate is used and the loss of time, to which may be added expensiveness, when a copper or iron oven is employed. The observance of the rule laid down in the text-books, to heat the blood-specimens up to 110 or 139 degrees C. leads to varying and conflicting results, histologically as well as micro-chemically. Every practical worker in hematology will testify to the puzzling difference of color and structure-pictures obtained in specimens of the same provenience, and sometimes in different areas of the same individual cover-slip preparation. This difference is often seen, all conditions being apparently equal. It was during my investigations of the blood-test in diabetes by means of certain anilin dyes that I discovered the extreme susceptibility of the blood elements to slight variations of heat as affecting differential and selective staining. Sometimes a difference of a few degrees, when in the neighborhood of the upper and lower heat limits would mar the reliability of the test. In order to eliminate the uncertainties resulting from arbitrary and unsystematic heating I strove to find the optimum temperature for hardening the blood-film and fixing the hemoglobin, and the time requisite to obtain uniformly good results. I ascertained that 135 degrees C. is the optimum temperature for cover slip preparations and that the time requisite to reach this temperature in the heating apparatus is about five or six minutes. These figures apply specially to the little improvised oven represented in the cut.

HOW TO MAKE THE OVEN.

Take a five ounce quinin can; bore two small holes through two opposite walls at equal distances, four

inches above the bottom of the can. Draw through them two copper wires, to support a square piece of wire screen cut to fit the interior dimensions of the can. A circular opening is made in the lid large enough for a perforated cord holding a thermometer, registering about 250 degrees C. In the four corners of the bottom of the can, holes having approximately the diameter of half a line are bored. They serve the purpose of establishing a draft for the proper circulation and diffusion of the heat. Unless the cork fits



very tightly in the opening made in the lid no holes are necessary in the corners of the latter. The cover glass preparations, smeared side up, are arranged in rows on the tray, care being taken that they do not overlie each other. The point of the bulb of the thermometer is to be adjusted in the same plane with the specimens on the tray. An alcohol lamp or a small gas jet may be used as heat generators. The temperature is run up to about 135 degrees C. in from four to six minutes. It is advisable to place the oven on a tripod or other metal stand, in order to prevent shifting and overlapping of the coverslips. One or two degrees above 135 will not interfere with obtaining a good result. Have the cover glass slips or slides in a perfectly horizontal position.

With an apparatus like this, examinations of the blood may be made at the bedside. Another advantage of the contrivance is the facility and readiness with which the preparations may be heated; they will then retain their specific selective staining properties for months, whereas the film not properly hardened loses them in a short time. Its chemic properties are easily affected by the dampness of the atmosphere.

Exact temperatures are more easily obtained with the little apparatus described than larger and costlier ones.

SOCIETY PROCEEDINGS.

Denver and Arapahoe Medical Society.

Meeting of March 22, 1898.

THE SERUM TREATMENT OF TUBERCULOSIS.

Dr. F. E. WAXHAM reported a series of ten cases treated with antiphthisic serum T. R. (Fisch), and he prefaced the recital by the following remarks: "It is with very great reluctance and hesitation that I present this paper tonight. We all naturally dislike to advertise our failures, but in order to get at the true value of any remedy or mode of treatment it is not only necessary to tell the truth, but the whole truth. It is the honest desire to determine the value of the serum treatment and to elicit a discussion that may help us to arrive at correct conclusions that prompts me to present this paper. The unfavorable results will not, I hope, be ascribed to poor judgment or unskilful treatment. It does not require special skill to properly give hypodermic injections, and in proof that the remedy was properly given I would state that out of something like one thousand injections there has not been a single abscess or other evidence of careless administration. The remedies have been carefully given and the patients carefully observed, and in no case was there febrile reaction. In nearly every case, however, there appeared about the fourth or fifth day serum eruptions upon the back causing considerable itching and discomfort, lasting two or three days, then disappearing." The cases were reported *in extenso* in the JOURNAL for March 19, 1898. The summary of the treatment is as follows: Number of cases treated, 10; cured, 0; died, 1; improved, 2; worse, 7; bacilli present in 9 cases, bacilli disappeared in 1 case. "Judging from these cases, we may safely say that the serum treatment in well-developed or chronic tuberculosis is a failure."

Dr. BONNEY said that Dr. Waxham's conclusions are in perfect accord with his views on the subject. He has observed a good many cases under the treatment of his confrères. The subject should be considered from both the theoretic and clinical standpoints. The drift of opinion of the greatest clinicians in Europe is against the tuberculin treatment. In Professor von Leyden's clinic there has been absolutely no success with the treatment. He also quoted the statement that Dr. Huber, Leyden's assistant, attempted to immunize animals in the way in which Koch does, but he failed in every attempt. The experiments were carefully carried out, the dosage of tuberculin was exact and sufficient and the observations numerous enough to do away with the idea that perhaps coincidence played a rôle in the results obtained. Yet he failed to get the desired immunity. "After the supposed immunization all the animals died when innoculated with tuberculous material, and interestingly brought before the control animals innoculated with the same material at the same time." Not only does he consider the tuberculin treatment useless, but in many cases it is absolutely harmful. What the patients need is exercise, nourishment and fresh air. Patients receiving the tuberculin treatment have to see the physician daily, they have to come down town and wait sometimes for half a day in the close atmosphere of the waiting room. The patient is thus deprived of the fresh air, the sunshine and exercise. He has seen a good many cases who have improved after the treatment was discontinued.

Dr. A. M. HOLMES said that he had had ample opportunity for investigation. He was one of the very first who took up the tuberculin treatment and he was greatly disappointed at the conclusions of Dr. Waxham. They do not accord

with his experience. He has reported in the JOURNAL a series of cases treated with the serum and they were of such a nature that all stages of the disease were represented. All of Dr. Waxham's cases fall within the category of one of his cases, namely, No. 8, which is by no means a favorable case for tuberculin. The pathology of tuberculosis must not be lost sight of. Like diphtheria, tuberculosis is a toxic disease, but in addition the tubercle bacilli are a new growth, which is entirely devoid of blood vessels. The tubercles undergo fatty degeneration and offer a nidus for further development of the disease. Being devoid of blood vessels the serum can not reach the seat of disease after it has advanced. It is only in early stages of the disease that we can expect to do some good. Because diphtheria under the antitoxin treatment shows a certain mortality there is no reason why we should abandon the treatment.

Dr. DENIM said: I read the report of the cases presented by Dr. Waxham in the JOURNAL received yesterday and at once concluded there was in these results a confirmation of an impression I had gained that we were more and more getting the transmitted effect of tuberculin as the dosage of the animal furnishing the serum was increased. In none of my cases reported to this society up to December 3 had I given the serum treatments every day, as in all these ten cases reported, but every second or third day. Even then, with less than half the total quantity used by Dr. Waxham in a given time, I began to notice increased reaction and effects. This was soon after reading my paper (December 14), and coincident with their reaching the largest immunizing dose given their horses in St. Louis (supposedly 100 c.c. of Koch's new tuberculin), I wrote to the manufacturers about this and tried to learn the dosage and time afterward that the serum of different dates was drawn. I received a reply from Dr. Fisch informing me that all the serum was made of the same strength but withholding the details I desired. For this reason, with the less favorable results I was then having, I gradually discontinued the use of the remedy.

Now Dr. Waxham's continuous two months' daily use of this serum was mostly since that time and therefore I say there is reason to suspect that either the dosage of the horses was getting to be too large, or the commercial demands for the serum may have led to the shortening of the period when the horses were to be bled.

This brings up the question I raised in my paper as to the possibility of there being a *transmitted* tuberculin or a *mixed* effect in antitubercular serums, and also whether this *indirect* way can be equal in immunizing power to the *direct* creation of antitoxin principle in a patient's blood. Thus far preference for the latter method is warranted by all the experience of which I can learn. My own results on this latter plan have been more satisfactory and lasting than by the indirect (serum) method. On account of the uncertainty involved it is a questionable procedure to crowd the use of this strong serum by *daily* use of the full doses advised. If there be, as with strong serum treatment there probably is, an uneliminated though indefinite reactionary influence left over from one injection to another, then there must eventually come a cumulative result which will be the reverse of what we are after. The affected system becomes surfeited with an effort, at first decidedly remedial, which is likely to be exhausting some time later.

The majority of these cases here reported for discussion are evidently too serious for such an heroic method. If, as the evidence seems to show, they were having a "good thing" during the first two weeks, they were getting decidedly too much of it during the seventh and eighth weeks. The ten cases reported would, in my judgment, have done far better even on crude tuberculin (given in very small doses with two or three days interval according to Dr. Whittaker's plan), not to mention the preference for the later improved derivatives of tuberculin, and I imagine the resulting immunity would be more genuine and lasting than that obtained by any serum yet discovered. Nobody knows exactly what we have in an antitubercular antiphthisic serum. The conversion of the tubercular toxin into an antitoxin in an animal's blood is not yet a clearly determined proposition either as to its completeness, the time required, or the quantity possible to be so converted. It may be that we are near to obtaining a pure antitoxin for tuberculosis created outside the affected human body. It may be that at the start Dr. Fisch was very near it, or that Dr. Hirschfelder may show that he has found the equivalent of an antitoxin; but as yet it seems that in any antitubercular serum we have only "mixed goods" and what we want is the pure article. So far as I can determine the conditions are not definitely known which will produce a pure antitoxic for tuberculosis, for instance as direct and pure as the diphtheria antitoxin.

For the present we had best content ourselves with the direct method which involves, or ought to be accompanied by, the strengthening of the individual resistance of the patient by every other possible means, such as climate, good feeding, exercise and a proper individualizing management suited to the case in hand.

Dr. WM. N. BEGGS—I happen to have come from St. Louis where, as you know, two serums for the treatment of tuberculosis are produced. The first was prepared by Dr. Paul Paquin. Mr. T. F. Milliken was his business manager. The second is the product of Dr. Carl Fish, Koch's T. R. tuberculin being the immunizing agent. Mr. T. F. Milliken is now his business manager. I have met both of the medical gentlemen.

It was my fortune to hear Dr. Paquin read the first report on the use of his serum before the St. Louis Medical Society. At that time I knew nothing of the cases, patients in the St. Louis City Hospital, and consequently could form no judgment as to the worth of the report. Since then I have learned, from some of the then assistant physicians of the city hospital, facts which led me to believe that the sources of error had not been eliminated. This I believe to be the case in nearly all of the cases of tuberculosis treated with serum throughout the country. I doubt the value of either serum in the treatment of tuberculosis. As we all know, the consumptives coming into charity hospitals are in the habit of knocking around the country, subject to all kinds of hardships and privations, until they have to give up and go into a hospital. Then, under the influence of quiet, rest, and nourishing food, they rapidly improve for a time regardless of the line of treatment pursued. Not until the full result of this hospital benefit has been reached is any opinion as to the effect of the medicinal treatment justifiable. The cases referred to as forming the subject of Dr. Paquin's first report were mostly patients in the St. Louis City Hospital, a charity hospital. They were taken as they entered the hospital, not after the full effects of the hygienic influence of the hospital surroundings had been reached, and placed under the serum treatment. Consequently that source of error (no small or unimportant one) had not been eliminated, and the general improvement can not be properly accredited to the serum.

Dr. Fisch's serum I have used in only two cases. Neither was a favorable case for any line of treatment and the results were correspondingly bad.

As Dr. Bonney had said, this subject must be considered from the scientific as well as clinical point of view. The question arises: Because the serum treatment has had most gratifying results in certain infectious disorders, must we necessarily conclude that that is to be the successful line of treatment in tuberculosis? There are certain differences between tuberculosis and those diseases in which the antitoxin treatment has shown conclusively successful results which it is well for us to bear in mind.

1. Those diseases are essentially acute diseases; tuberculosis is not.

2. Those diseases are strictly toxemic diseases; tuberculosis is a neoplastic disease as well as toxemic.

3. In those diseases the retrogressive changes are such as may be recovered from without loss of tissue; in tuberculosis there is always absolute destruction of tissue.

4. In those diseases the bacteria are not scattered through the tissues, but have a definite localization. The source of toxin formation is single, not multiple. In tuberculosis the opposite is the case.

5. In those diseases the source of the toxins is usually readily accessible to the therapeutic agents. In tuberculosis the bacilli are within a neoplastic tissue, a non-vascular tissue. This means that in them the movement of the tissue fluids is exceedingly sluggish, in the necrotic centers practically absent. Consequently the therapeutic agents fail to reach the source of trouble.

6. In those diseases the bacteria are usually destroyed or discharged from the organism quickly; therefore the administration of the antidote to the toxin is continued for only a very short time. In tuberculosis the tubercle bacilli are continuously present for great periods of time, and the administration of the antitoxin would necessarily be as protracted.

7. In most of those diseases (diphtheria is an exception) the survival of an attack confers an immunity to the individual. No such thing is known in tuberculosis.

8. Those diseases are all self-limited diseases. If the immediate intoxication is not too great and the patient survives for a really short time, he recovers. There is no characteristic self-limit to tuberculosis. The statements justify us in asserting that it is utterly impossible for an antitoxin to be the proper and specific therapeutic agent; but, in view of them, we are not justified in drawing the conclusion from analogy that it is the rational treatment.

Two other points raised in the discussion I wish to make.

The first is in reference to the degenerative change occurring in the tubercle. The characteristic and constant retrogressive change in the tubercle is not fatty metamorphosis, as has been stated, but coagulative necrosis. The other is in reference to the prognostic value of the number of tubercle bacilli to the field occurring in a cover glass preparation of sputum. I believe there is no more fallacious standard upon which to base our prognoses. I have repeatedly had the experience that in one film I would meet with untold myriads of tubercle bacilli, whereas in many other films from the same sputum they would be present in moderate numbers only. Again, it is not infrequently the case that in making daily examinations of the sputum in the same individual the bacilli would be comparatively few for a number of days, then for a day or two very numerous, to be followed by a period of comparative sparseness. I repeat that I believe this the most fallacious means of arriving at a prognosis.

Dr. SIMON has had three cases and none have shown signs of improvement. One case showed alarming symptoms at first which, however, soon subsided. He has given the treatment a fair trial. The cases were favorable for treatment.

Dr. EDSON—Early cases will do well under climatic treatment. What we look for is some reliable treatment in the advanced cases, and this everybody seems to admit that the tuberculin T. R. does not offer.

Dr. WHITNEY summarily deprecated the use of the serum. He followed closely the literature on the subject, and he concluded long ago that it would not be worth while to subject his patients to this experimental treatment.

Dr. MUSSEY—This discussion has been to me an apt reminder of the proverb that "a prophet is not without honor save in his own country." The trouble with this remedy seems, in part to be that it is produced too near home. The tone of the discussion, tonight, in reference to the remedy has been, in the main, condemnatory. This, I consider as uncalled for. I was sorry that the essayist did not elaborate more fully the cases reported, especially in reference to the action of this serum.

My own experience in the use of Fisch's serum has been limited to the treatment of seven cases. These cases, two in incipient, three in moderately advanced, and two in advanced stages, have been carried through an average of two and a half months' course of treatment. I will say that my experience has been disappointing only in that I have failed to obtain remarkably good results, not that any case has been injured through the treatment. Three of these cases gained materially in weight, one patient making a gain of twelve pounds in three months. That this remedy is in any regard a specific, is not in my opinion to be credited. It has failed to modify temperature, to check night sweat or to modify the character or quantity of the expectoration in the time we were lead to expect such results. Beneficial results have occurred only in those cases in whom we would look for improvement through our climatic advantages. Several of these cases have shown peculiar reactions from this serum. Rashes, localized and distributed urticarias, temporary enlargements of the axillary glands and on two occasions alarming symptoms have been manifested due to the too sudden ingress into the circulation, as embarrassment of the respiration amounting to extreme dyspnea, cyanosis, swelling of lips, eyelids and transitory circulation embarrassment. With the exception of these transitory reactions, no unfortunate results have occurred in any case, and nothing has transpired to lead me to believe that I was dealing with a dangerous remedy.

In going over to a theoretic discussion of a tubercle antitoxin it is hard to believe as has been suggested this evening, that a toxin can be carried through the body of a horse for months to reappear again in the serum of that horse's blood as a toxin, when the animal has for weeks recovered its normal condition of health. It is still more difficult of belief that a complete immunization of animals has been secured. It is my belief that the future specific will appear through the serum of artificially immunized animals, and I would deprecate the making light of work which is being conscientiously carried forward in this direction. As has been most ably presented this evening, the difference in the pathologic process of tuberculosis from other affections in which antitoxic cures have been perfected, the fact that here there is no self-limited affection, and that a neoplastic formation takes place in the tissues, argues only the difficulty of the problem, and presents only the barriers which must be surmounted, but in no way proves that these difficulties may not be overcome, and science be made to score a new triumph.

Dr. M. H. MACK read a paper on the "Necessity of Early Operation in Cases of Abscess About the Rectum." Delayed operations, he said, are etiologic factors in fistula ani. The subject was discussed by Drs. S. D. Von Meter, Stover and Spivak.

Chicago Ophthalmological and Otological Society.

Regular meeting held March 8, 1898.

President, W. F. COLEMAN, in the Chair.

LARGE EPITHELIAL FLAP GRAFTED ON THE EYEBALL IN A CASE OF EPITHELIOMA OF THE CONJUNCTIVA.

Dr. F. C. HOTZ—I wish to present tonight a patient from whose right eye I removed a large growth February 7. The growth started in the conjunctiva near the sclerocorneal border. I have here two pictures showing how it appeared in August and in December. You will notice that the growth is very vascular, and there is a good deal of engorgement of the conjunctival and subconjunctival vessels. The tumor invaded the corneal margin to a slight degree, about a millimeter or a millimeter and a half. Below the growth the corneal margin showed a narrow stripe of thickened epithelium and the adjoining conjunctiva was also thickened just as we observe it in beginning pterygium. In removing this growth I dissected it off from the cornea carefully, and I also took out with it the suspicious-looking part of the conjunctiva below. This left quite a large defect on the eyeball; the sclera was exposed and the conjunctiva was much retracted so that there was no possibility of covering the wound by sliding the conjunctiva over it. I therefore resorted to grafting, and I should have done the Thiersch grafting, as I have done in a number of operations for large pterygia, had it not been for a suggestion Dr. Gifford made in a paper published in the December number of the *Ophthalmic Record*. I have always felt disinclined to use mucous membrane, because in cutting the flaps out with forceps and scissors you get more tissue than you want, and especially submucous tissue. You have then to prepare a flap, turn it over and clean it, a procedure which in such a delicate structure as the mucous membrane is not easily carried out. That is one of the reasons why I prefer Thiersch grafts, because they are so easy to handle. Dr. Gifford recommended cutting what is called an epithelial lip-flap with the razor, so as to get a thin strip of say one half thickness of the mucous membrane. I resorted to that method. After the operation on the eye was done I took the lid clamp and clamped the lower lip into it with the ring on the mucous side and used a drop of holocain, with which I anesthetized the area of mucous membrane within the clamp; as quickly as I can say it, anesthesia was obtained, and then with the razor I could shave off a flap without causing any pain. I took an epithelial flap about one centimeter and a half long and one-half a centimeter wide. This flap floating on the razor, in sterile salt solution, was carried to the eye and dumped down so that it floated from the razor with the proper side down on the eyeball and spread out. The graft was so large that I mistrusted somewhat its security by leaving it without tying it fast. After it was spread out I allowed the patient to close the eye and then open it again, and I saw it had shifted and wrinkled a little. To make sure I took fine silk sutures and fastened the graft to the upper and lower borders of the conjunctival wound, so as to have it fastened at these two ends to prevent its slipping. As you see, the eye has made a nice recovery, and the epithelial graft makes a perfect substitute for the lost ocular conjunctiva.

The case is very interesting from another point of view, and that is with reference to the nature of the growth. It was very vascular, and in dissecting it off bleeding was quite profuse. The microscopic examination, which was made by Professor Herzog of the Policlinic, showed that it was an epithelioma of the conjunctiva. Dr. Herzog was kind enough to furnish me with this very nice drawing and several slides, but I am sorry I did not bring the slides with me tonight. The drawing shows the growth of epithelial masses down into the connective tissue. From the microscopic examination of the specimen we could come to no other conclusion than that it was an epithelioma of the conjunctiva. The epithelial cells are flat and cylindric toward the deeper part, showing plainly that the masses are growing into the subepithelial connective tissue. The growth is quite rare. Cases of carcinoma of the conjunctiva are not frequently reported. In looking over Graefe's *Archiv*, for instance, I could find reports of only half a dozen cases. One of the cases was reported by Graefe himself, who gave a description which is very much like the clinical picture presented in this case. It was a case which at first was thought to be a large and unusually obstinate phlyctenula, with marked injection of the surrounding ocular conjunctiva. He removed the tumor and Virchow made a microscopic diagnosis of epitheli-

oma. In that case, after a year there was no recurrence. In my own case I think the prognosis, on the whole, is favorable, inasmuch as the microscope shows that it is rather a slow growing tumor, and as I succeeded in covering the wound, which healed kindly, there is good chance for the eye to escape a recurrent attack.

Dr. FISHER exhibited an interesting case of

PARALYSIS OF BOTH ABDUCENS,

with contraction, not only of the muscles that rotate the eye inward, but of the orbital tissues.

Dr. J. E. COLBURN—Last winter a patient came to me with one eye very much in the same position that we find this patient's two eyes, and with a history that when 6 years of age the eye became convergent and had remained in its converged position ever since. When I saw him the conjunctiva was red from exposure. He was an out-of-door man. I advised enucleation, as the other eye was perfectly good and the affected one was very unsightly. Before advising enucleation, however, and after using cocain, I found I could not move the eye by forcible means any more than could Dr. Fisher in his case. I obtained the consent of the patient, and enucleated the eye. I found it about one-third longer than the normal eye in its antero-posterior diameter, and very irregular in form. I could not find the adductor muscle, and the abductor muscle was almost equally obliterated, but the connective tissue at the inner canthus was firm and cicatricial. The man assured me that so far as he knew he had never had any inflammatory condition of the eye.

PRIMARY CARCINOMA OF THE CONJUNCTIVA.

Dr. C. D. WESCOTT—I would like to describe a case recently seen in which as yet no microscopic examination has been made. The patient is 67 years of age, and presented himself with a tumor which overhung the cornea, evidently growing from the eye just up and out from the cornea, and which was beginning to slough. It was not feasible to remove the tumor from the eye, though the cornea appeared normal, and it was impossible to tell before the eye was removed whether the tumor was partly intraocular or not. Enucleation was performed, and upon making section of the eye no abnormality was found within the globe. The tumor had its origin from the conjunctiva just without the limbus, up and out. It is not pigmented and has the gross appearance of carcinoma, and I believe it to be primary carcinoma of the conjunctiva. The growth had extended back underneath the conjunctiva somewhat, and in making my enucleation I removed a portion of the fornix in order to get all the tumor. The specimen is now being hardened for microscopic examination, and I shall show a slide of it at some future time.

The beginning of the tumor was like that of the one described by Dr. Hotz. It appeared as a little reddened pimple and grew slowly, having reached the size it finally attained after three years. The man was a farmer, and remote from any physician, and nothing had been done for the eye until he came to see me, at which time the tumor had begun to slough at the apex. The tumor was so large that the lids were widely separated and it was constantly exposed and irritated.

EPITHELIOMA OF THE CONJUNCTIVA.

Dr. J. E. COLBURN—Some of the members may recall the case of a physician that I reported two years ago, from whom I removed a malignant growth from the cornea, or rather destroyed it. It involved the conjunctiva toward the inner canthus. I removed the growth the first time thinking it was a pterygium. The second time I removed it, knowing it to be a malignant growth, and the third time I destroyed it as thoroughly as possible with the galvanocautery. The tissues were so much involved that there was absolutely nothing that could be removed without destroying the sclerotic. I burnt over nearly one-third of the corneal surface and quite an area of conjunctiva. It has now been nearly three years this spring since I removed the tumor and there are no indications of its recurrence. There was a good deal of astigmatism following the burning, but the eye assumed its normal condition and the translucency of the cornea is good, and vision is better than it is in the other eye.

PRIMARY EPITHELIOMA OF THE GLOBE.

Dr. W. F. COLEMAN—I will relate a case that came under my observation some eight years ago. I can not describe it as minutely as I would like to do. The case was that of a man 40 years of age who presented himself with a growth on the left sclera between the cornea and external canthus. The growth was circumscribed and slightly pedunculated. I suggested snipping it off, but the man objected and did not report for about six months, when it had increased to the size of a small bean. It had grown so rapidly and was so vascular that I diagnosed an epithelioma and suggested its removal at once, telling him that he would lose his eye if he did not submit to an operation. I removed the growth and gave the specimen to Dr. Casey A. Wood, who examined it and pronounced it epithelioma. It is the only case of primary epithelioma of the globe I have seen.

Dr. C. P. PINCKARD—Dr. Tilley showed a case to the Society about a year and a half ago in which the cornea of both eyes were turned in and down, and in this case there was slight motility of both sides as in Dr. Fisher's case. Dr. Tilley's was, however, a congenital case.

Dr. W. W. WHEELOCK, Fort Wayne, Ind., reported cases and exhibited specimens.

RHINOLITH OR FOREIGN BODY.

Dr. WM. L. BALLENGER—I have a specimen which I did not intend to present tonight, but it has been suggested that I do so. This specimen was removed from the nose of a patient at the Eye and Ear Infirmary some two or three months ago. The case was in the service of Dr. Wilder. The man was 60 years of age, upon whom Dr. Wilder had operated for cataract, and noticing an offensive odor from the nose he suggested that he have his nose examined and treated while in the institution. One of the internes, Dr. Ainesley, examined the man's nose and made a diagnosis of rhinolith, and with his assistance I removed it from the nose. The offensive odor had been present for about thirty years. At the time I removed the foreign body I supposed it to be an ordinary rhinolith, as it had all the appearances of it. Some two months later I removed the exterior portions of the specimen and before I had gone very deeply into it I found a piece of iron. Upon cleaning it up a little more it was seen to be the breech-pin and nipple of an old-fashioned percussion-cap musket. The man stated that thirty years ago a gun had exploded, destroying his left eye. He is now in the State of Illinois somewhere and I intend to look up the record of the case more fully and ask him for all particulars concerning the explosion. This portion of the gun [exhibiting] passed in through the orbit and possibly lodged in the ethmoidal cells or in the antrum of Highmore. After a time the walls sloughed away and the specimen lay loose in the nose. It could be moved back and forth an inch and a half. With the aid of a strong pair of dressing forceps I succeeded in removing the specimen. The man objected to taking an anesthetic. The specimen is much smaller now than when I first removed it. It weighed at that time 325 grains.

CATARACT.

Dr. C. D. WESCOTT—I would like to recount another interesting experience which I have had recently. A woman came to have an operation for cataract. She was 73 years of age and gave a history of blindness in one eye for twenty-five years. There had been no involvement of the other eye until very recently. On examining the good eye I found beginning peripheral changes in the lens, with some senile changes in the fundus, and gave a very unfavorable prognosis in regard to the other eye. The patient was prepared for operation, however, and I proceeded to extract the lens. I expected to encounter a Morgagnian cataract, but when the thickened and opaque capsule was ruptured the contents proved to be entirely fluid and about the consistency of ordinary pus. There was a good deal of cholesterin present and some gelatinous matter, but there was absolutely no trace of solid nucleus. I coaxed it all away by gentle manipulation of the cornea without any difficulty and extracted the capsule entire with the iris forceps. Healing was ideal, with scarcely any hyperemia of the eye at any time. The bandage was discarded on the seventh day after operation, and vision with correction two weeks after operation is $^{20}/_{100}$, although the eye had been divergent for many years, and for twenty-five years she had seen nothing with it. It was interesting to see the eye straighten up and vision gradually come to it as the tests were made. Examination with oblique illumination shows a single thread of capsule across the pupil and a number of cholesterin crystals can be seen clinging to it. The iris is tremulous, just as we see it in cases of dislocation of the lens.

Dr. W. F. COLEMAN—I would like to ask if any of the members have had any experience in washing out the chambers after extraction. Personally I have had no experience with it. Possibly it may be an advantage in preventing the necessity for a secondary operation.

Dr. F. C. HOTZ—In regard to Morgagnian cataracts without solid nucleus, these cases are rare. Usually we find small solid lenticular nuclei, and if the capsule is clear the optical results are very good. It is surprising that Dr. Wescott did not get more vision than $^{21}/_{100}+$ in his case, and it would be interesting to watch it and see whether education will bring back the sight; whether it is a case of amblyopia from non

use, as this is still an unsettled question. It would be interesting to see whether the vision of the operated eye will gradually improve when the cataract in the other eye progresses so as to make its sight dim and useless.

Dr. C. D. WESCOTT—Undoubtedly vision will never be good, because of the amount of choroiditis in the eye. Both eyes are equally involved in senile changes of the choroid. However, as it is not uncommon to see vision of $^{20}/_{70}$ or $^{20}/_{100}$ two weeks after operation increase to $^{20}/_{30}$ and better, it may do so in this case.

Dr. COLEMAN—How long has the eye been divergent?

Dr. WESCOTT—I can not say positively, but she said a great many years. Sight failed slowly at first, beginning twenty-five years ago, and for a great many years the eye had been divergent.

Dr. W. F. COLEMAN—In talking with Dr. Lippincott two years ago he said he had tried physiologic salt solution, and had finally resorted to 0.5 per cent. solution of boric acid. He claims that it is very rare that a secondary operation is required. If this is accomplished I am sure the risks of cataract are very much reduced. So far as reports go the risk attending secondary operations is six times as great as that in primary operations.

Dr. F. C. HOTZ—You say, Mr. President, that you had a conversation with Dr. Lippincott two years ago?

Dr. COLEMAN—Yes, sir.

Dr. HOTZ—Last summer Dr. Lippincott told me that he had given up washing out the anterior chamber after operations. I have always regarded the washing out of the chamber as unnecessary, because removed particles of lens matter in the anterior chamber are harmless and get absorbed, and I have never washed out the capsule, because it looks to me a hazardous procedure to resort to these injections after the eyeball is opened, when there is nothing but the tender, slender posterior capsule to hold the vitreous back. To poke around with the nozzle of a syringe in the capsular sac for the sake of removing some lens matter adhering to the capsule is dangerous, and I do not think any gentle washing would remove the particles. Besides, these particles are eventually absorbed and do not play an essential rôle in the production of secondary cataracts. These are chiefly caused by wrinkling of the capsule and inflammatory processes.

Dr. W. F. COLEMAN—Has any one had any experience in removing the anterior capsule with forceps instead of using the cystitome?

Dr. GRADLE—I have tried it a number of times but did not always succeed. If the capsule is very much thickened then you can succeed, but in my cases there was not very marked thickening of it.

MORGAGNIAN CATARACT.

Dr. C. D. WESCOTT—I saw an interesting case of Morgagnian cataract in Philadelphia last June in the clinic of Dr. de Schweinitz. The patient was a woman about 75 years of age. After the iridectomy the capsule refused to be cut. Dr. de Schweinitz made two or three forcible efforts at incision, and then with a good deal of pressure delivered the nucleus, which was floating in fluid in the capsule. It was like a little pebble in a string sack containing fluid. He lost about six or eight minims of vitreous because his efforts at the delivery of the lens were necessarily quite forcible. He closed the eye after a hasty cleansing, and subsequently wrote me that the wound healed kindly. I have forgotten what the vision was, but it was good for such an eye.

Dr. C. P. PINCKARD—Did he take it out with a scoop?

Dr. WESCOTT—He simply depressed the upper lip of the wound with a spoon, making pressure upon the lower border of the cornea with a spatula and squeezing it right out. As it popped out some of the vitreous escaped.

Chicago Gynecological Society.

Regular Meeting held March 25, 1898.

The President, Dr. HENRY P. NEWMAN, in the Chair.

Dr. C. S. BACON showed a specimen of

HYDROCEPHALUS.

Sickle, he said, had collected statistics of 65,000 births, and found the frequency of hydrocephalus to be 1 in 6000. Lachapelle, in 50,000 labors, found the frequency of hydrocephalus to be 1 in 3000, while Winckel found its frequency to be 1 in 2000. The number of deaths following delivery was about 25 per cent., and of these about 13 per cent. of the cases were due to rupture of the uterus. The head measured after delivery, and after the fluid contents had been evacuated, in the occipito-mental circumference, fifty-one centimeters. The patient was a primipara in the thirty-eighth week of gestation. Forty-eight hours after the membranes had ruptured he saw the patient and found the uterus very much distended in its lower segment and in a state of tetanic contraction. The patient was anesthetized, the head punctured, a cranioclast applied and the head extracted. Following the extraction of the head, the contents of the uterus behind the child, which had become putrid, were expelled. The placenta was expelled by Credé. The patient was rapidly convalescing.

Dr. REUBEN PETERSON showed

FORMOL GUT IN HERMETICALLY SEALED GLASS TUBES.

When he began his abdominal work he feared the use of catgut on account of his inability to render it absolutely sterile, and he had used silk almost altogether. Increased experience, however, had convinced him that catgut should be used, if it could possibly be rendered sterile in any way.

Dr. ALEX. H. FERGUSON said that sometimes bad results from catgut were attributed to the catgut, but the catgut itself was not at fault. The fault might be with the nurse, the receptacle containing it, the assistant, or sometimes with the surgeon himself. The catgut prepared by Mr. Hollister, and put in sealed tubes, as advised by Dr. Peterson, recommended itself to him as being surgically ideal. The speaker had performed a number of experiments with a view to determining the length of time in which catgut would become absorbed, and finds that aseptic catgut becomes absorbed more rapidly than antiseptic catgut which is hardened with pyoktanin. That which remains the longest of all in the tissues is chromicized catgut. Very stout chromicized catgut remains in the tissues six weeks.

Dr. ALEXANDER H. FERGUSON read a paper on

URETERO-VAGINAL AND URETERO-ABDOMINAL FISTULÆ,

in which he reported two cases of ureteral fistula that occurred in his practice, and which led him to investigate this interesting and comparatively rare surgical affection. The essayist had collected sixty-five cases, which with the two of his own, made sixty-seven cases in all. Of this number sixty were uretero-vaginal, four uretero-uterine and three uretero-abdominal. This does not include fistulæ from the kidneys, nor the ureterolumbar and uretero-inguinal varieties. No cognizance was taken of the various primary operations performed on patients, accidentally injured ureters while operating upon the pelvic organs. The ages of the patients varied from 19 to 64 years, excluding those persons having the congenital forms. The author then dwelt upon the etiology, and considered at some length operations and results, after which he reported his two cases in detail.

He drew the following conclusions from the sixty-seven cases of ureteral fistulæ reported:

1. The left ureter is more frequently the seat of trouble than the right.

2. The most frequent variety is the uretero-vaginal, and the rarest is the uretero-abdominal fistula.

3. The most common cause is difficult labor; and forceps delivery is a prominent etiologic factor.

4. Of all the operations performed in the pelvis, vaginal hysterectomy is the most frequent cause of ureteral fistula.

5. Other conditions being favorable, all cases of ureteral fistula are curable by operation: *a*, In all cases of uretero-vaginal fistula the direct method of operating should be selected and no particular operator's method is applicable to all cases. When the ureteral opening is situated close to the bladder, Schede's operation is the most surgical and is applicable to the greater number of cases; when situated far away from the bladder, as in my case, a plastic operation on the principles carried out by me should be tried before a graver or more mutilating procedure is thought of. Intraperitoneal operations are suitable for the abdominal fistulæ.

6. For the cure of uretero-vaginal fistula, it is in my opinion absolutely unjustifiable to perform hysterectomy, nephrectomy, or kolpokleisis. When septic infection of the kidney occurs it may be necessary to open or remove it. It bespeaks lack of surgical ability to remove a kidney, a uterus, or close a vagina in these cases of simple fistula.

7. Another procedure which I think uncalled for is transplanting of the cervix uteri into the bladder for the treatment of uretero uterine fistula, for it causes sterility and the menstrual flow is abnormally directed, and besides a disturbed bladder might cause a backward flow of urine into the uterus, Fallopian tubes or even peritoneal cavity, depending upon the condition of the organs.

8. Directing the urine into a bowel is only justified when any other operation can not be performed. While ureteroenterostomy has been successfully performed it has but little to recommend it on general principles.

Dr. FRANK A. STAHL read a paper entitled

SOME OBSERVATIONS ON THE TREATMENT OF ANTEMATURE LABORS, ESPECIALLY OF ABORTION,

in which he said that when the physician of experience is called to a case of mature labor, in the conduct of it he is guided by a policy, the fruit of a ripened clinical experience, which he indicates in the brief but expressive sense, "trust nature, interfere only when necessary." Therein he but reflects the scholastic doctrine, "interfere then when danger presents to mother or fetus." Nature teaches that in all forms of labor, whether at the first month or at the tenth, the stages and principles of labor are always the same, the details of technique only modifying to meet the indications of the case. Can these generalizations, applicable to labor at term, be applied with equal safety to antemature labors, the abortion, the immature and the premature labor? He thinks so, and further believes that if he will be so guided, the general practitioner or the experienced accoucheur will never be too late with his assistance, and less often guilty of dangerous though well meaning anticipatory assistance. The results, so far as the attendant is concerned, will always depend upon, 1, the significance attached to the indication; 2, the method chosen to treat the indication, both being interdependent.

In illustration of his line of argument three cases were cited by the author from the literature of the subject, one resulting fatally from too conservative measures, and the other two beautifully illustrating how the pendulum had swung to the other extreme of radicalism, where major operations were undertaken to overcome minor conditions. A method to be proper and successful, possessing sufficient elasticity to meet the requirements of all cases, must combine the elements of both the so-called conservative and radical procedures, but without the extremes of each, viz., be conservative in the presence of a normal course abortion; be radical in the presence of an abnormal course abortion.

The author divides abortions into:

Normal course abortions.—Those where (1), dilatation occurs without pathologic manifestations; (2), expulsion of fetus in abortion is of little or no importance; (3), expulsion occurs *en masse*, or where retention with dilatation of os continues no longer than twelve hours, that is, from morning till night, or night till morning, in both cases without pathologic manifestations. Here he favors the conservative method, to pack and wait, giving nature an opportunity to act.

Abnormal course abortion.—(1), Where dilatation progresses so slowly as to cause serious exhaustion, both physical and mental; this is an experienced sense; (2), where, with dilated os, retention continues longer than twelve hours. The dangers of exposure are too serious to chance anything, notwithstanding an exceptional favorable case; (3), all abortions where there is danger, regardless as to character, as from infection, serious hemorrhage, chill, sepsis, or any other condition indicative of danger. Here he favors the radical, empty-at once method of treatment. These phases of abortion and their treatment were dwelt upon at length. In the treatment he divides abortions into two classes: *a*, those in which dilatation is incomplete or *nil*; *b*, those in which dilatation is complete. In abortion the first stage is only complete when it is such that the important passenger, the secundines, may pass.

To favor dilatation the author uses laminaria tents, notwithstanding objections raised to their use in many directions. He believes the unfavorable results of the laminaria tent have been due to the errors of the operator rather than to the use of the laminaria tent, *per se;* he rejects *in toto* the sponge tent. Often the secundines with dilatation may be simply removed with placental forceps, blunt curette or hooked out with finger.

In the manner of performing curettage, the author said there are those who prefer the blunt curette, and some the sharp curette. Personally, where there is a choice, he prefers the finger, and believes that in abortions, as in other forms of labor, to remove the secundines there is no instrument that for safety, information, thoroughness, and differential diagnosis, is equal to the finger. In the choice of the finger to curette, the speaker differs from Lusk, in that he uses the middle instead of the index finger, stating that it has a longer reach, swivels better, and is stronger. He claims, with the finger, to have always avoided the unpleasant necessity for secondary curettage with the dangers from primary secundine skipping, which is the especial and not seldom occurring danger with instrumental curettage. Thus vital energy is conserved and convalescence established with less exertion. Having emptied the uterus, he irrigates with warm (not hot) 2 per cent. carbolic solution, not especially for its germicidal effect, but for its cleansing, stimulating and alterative qualities. He has never found it necessary to pack the uterus after curettage, notwithstanding he has encountered many sapremic and septic cases. The speaker then reported six instructive cases.

DISCUSSION.

Dr. C. S. BACON said the dangers of abortion were chiefly two, sepsis and hemorrhage. He agreed with the essayist that the indications for hysterectomy in cases of sepsis in abortion, and after labor at term, must be extremely strict, although there was a tendency at the present time to remove the uterus when the indications were not sufficient to warrant it. The measures for the management of incomplete abortion were considered under three heads. 1. The method recently recommended and advocated by Dührssen, of packing the interior of the uterus with iodoform gauze, thus producing strong uterine contractions, expulsion of the entire contents of the uterus and the remaining portions of the egg. 2. Removing the remaining portions of the egg with the curette. 3. Removal of the egg by means of the finger. The advantages of the finger were the greater certainty of diagnosis of the exact condition, and the more complete removal of secundines. He called attention to the dangers arising from the use of the finger. Its use required a larger dilatation of the cervix than the curette. If the cervix was dilated by a rapid dilator there was danger of tearing it, and of producing injury. Sometimes rupture might take place. He believed the essayist was correct in objecting to rapid dilatation in order to introduce the finger. He referred to the danger from dilatation by laminaria tents. The curette could be used without dilatation of the cervix, and the uterus could be cleaned out at once with it, which was an important consideration when there was any infection or elevation of temperature. The only two objections to the curette were the danger of perforating the uterus and of leaving some of the secundines. With the proper kind of curette there was no special danger of perforation. The leaving secundines behind or portions of membrane was due to lack of care.

Dr. REUBEN PETERSON thought the time had gone by for the use of laminaria tents in gynecology. He thought no more dangerous method could be adopted for dilating the cervix, whether puerperal or non-puerperal, than the introduction of a laminaria tent. He considers every abortion as an abnormal condition of the uterus, and such patients were fit subjects for surgical operations, and that whenever he has a case of inevitable abortion he treated it as a surgical case. He was also convinced that there was a field for hysterectomy in certain cases of abortion. He agreed with Dr. Bacon as to the use of the finger in cases of abortion.

Dr. SAMUEL L. WEBER thought Drs. Bacon and Peterson were a little too severe on the use of the finger in cases of abortion. He agreed with them that in the majority of cases the physician could not get along with the curette alone, particularly in inevitable abortions before the second month, when the egg itself was small. However, there were many cases in which it was absolutely essential to use the finger. A curettement for incomplete abortion could no more be thoroughly done, in his opinion, without the woman being under the influence of chloroform than a curettement for endometritis.

Dr. ALEX. H. FERGUSON said he made a distinction between those cases that had and those that had not been tampered with. The cases in which a sound had been passed, either by the patient or a physician, were usually septic from the start.

Dr. HENRY P. NEWMAN directed attention to a paper read by him before the AMERICAN MEDICAL ASSOCIATION last year on abortions, in which he presented his method of dealing with these cases, believing that it was the adopted method of his *confrères* but found it was not. He regards abortion as a pathologic condition from the beginning, and deals with it promptly. He referred particularly to cases up to the third month, where in the majority of cases, the decidua remained and interfered with involution of the uterus, the uterus remaining hard and heavy. In such cases more or less damage was done to the uterus and to the woman. This was the source of many displacements and of chronic lesions of the uterus and its adnexa. He could not let the opportunity pass without cautioning those engaged in the practice of obstetrics, and in general work, not to trust to nature in this class of cases. His manner of dealing with them was similar to that mentioned by Dr. Peterson. He makes an important procedure of it. believes that it should be done deliberately and under strict antiseptic precautions, every little detail being carried out with exactness. The curette was a safe instrument if properly used. After thorough inspection and cleansing out of the uterine cavity, he uses a strong application of carbolic acid and iodin, so that if shreds of secundines are left they will be destroyed by the cauterizing effect of the acid. The uterus is then packed with iodoform wicking, leaving its lower section rather loosely packed

with a single strand or so extending through the cervix, inasmuch as we desire drainage and the stimulating effect of the tampon in the uterine cavity.

Dr. STAUL, in closing, said the same objection could be urged against the introduction of the hand in forceps extraction or in turning, or in extraction of the placenta after mature labor. Physicians did not hesitate to enter the uterine cavity with their finger in such cases. Furthermore, in doing hysterectomy, the surgeon did not hesitate to enter the uterus with his finger, and it seemed to him that there was as much objection to doing this as there was in using the finger in cases of abortion. His results had been very favorable following the use of laminaria tents.

SELECTIONS.

The Plague-Spots of Bombay: the "Chawls" of the Native Sections.—In the London *Lancet* (February 26), we find an editorial review of some of the recent official investigations regarding the plague in Bombay. It refers to one reported condition that is comparatively new, namely "that the important factors to be remembered were the filthy and insanitary chawls" which are inhabited by 70 per cent. of the population of Bombay. These "chawls" are mostly great tenement buildings, many of them from five to seven stories high, built on the flat system. Through the length of each flat runs a corridor, the interior of which is dark and unventilated, in which are situated latrines and out of which open on either side the doors of the numerous tenements. The rooms are about 8 by 12 feet in area, and each one is generally occupied by from six to eight persons or even more. So crowded are these chawls on any given area that window openings in respective blocks look one into another; they are therefore commonly kept covered, and apart even from this the rooms are so dark that, according to one inspector, artificial light had to be used in them by day. Between two rows of chawls is a species of back passage into which the inhabitants throw filth from the floors of the chawls, each of which is referred to as often containing from 500 to 1200 inhabitants, and these passages, it is said, are rarely scavenged. It is also pointed out that these chawls were erected to meet the demands of the cotton industry, and hence they are the outcome, not of native ignorance, but of Western civilization so-called. The same reporter estimates that the overcrowding due to these chawls is three times worse than anything that could be found in London, and his astonishment was, not that plague had become epidemic in Bombay, but that the disease had not carried away half the population. Sir Richard Thorne has emphasized the fact that the influence of soil in its widest sense was one of the first considerations to be held in view as regards a filth disease, such as plague, and he has pointed out that these chawls afforded precisely the soil needed for the maintenance of the epidemic. Even ordinary garden soil teems with micro-organic life, and pathogenic organisms find in soil a favorable medium for life and multiplication. One point only did he appear in any way to criticise in a certain official paper recently published, namely, the assertion that anxiety must remain unless science can suggest some effective means of eradicating the plague bacillus. As to this he contended that there were times when the appeal should be to practice rather than to science, and that so long as the chawls of Bombay remained what they are it was of no use to call upon experts or to wait for advance in science. Although it is doubtless a mistake to believe that the great fire of London freed that metropolis from its plague, yet, if medical considerations were alone in question, the destruction by fire of the chawls of Bombay would, he insisted, in the long run end in gain. "So, also, as regards the eradication of the plague bacillus, this is not what is wanted; it is rather the removal of conditions which enable an accidentally imported specific organism to multiply and spread. Action on this principle has all along been our English practice. We are prepared to receive any number of vessels from western ports of India; we never propose to quarantine them lest they should carry plague bacilli; but we aim at receiving those vessels under conditions which are inimic to foreign pathogenic organisms."

Neuroses of Gout.—In a paper upon this subject presented to the Mississippi Valley Medical Association, Dr. L. Harrison Mettler of Chicago takes the position that the uric acid is not the cause of the familiar nervous manifestations of gout. He states that in the main, there are three general theories in regard to these neuroses. The followers of Haig believe that they are due to uric acid in the blood (chemic theory). Others think that they, as well as true gout itself, are but expressions of a neurotic diathesis (neurotic theory). Still others, with whom the author places himself, hold the view that a nervous taint, acquired or inherited, is the essential cause for gout and all the gouty manifestations; whereas these manifestations may be enhanced or made to assume variable characteristics by the auto-intoxication which is itself a result of the faulty metabolism produced by the original faulty innervation. With Cullen and Duckworth, therefore, he maintains that the gouty manifestations primarily are the result of a trophoneurosis. Faulty innervation, inherited or acquired, deranges the metabolic functions of the tissues, certain toxic excrementitious products are over-elaborated or uneliminated, and these reacting again upon the various nervous apparatus give rise to the said neuroses. These excrementitious products, as seen in the urinary alloxuric substances, consist of uric acid in combination with certain xanthin bases. In the gouty state the uric acid is frequently diminished in amount, but the increase of the xanthins explains the total increase of the alloxuric substances. With Kolisch and some other investigators, the author believes that the retention of the xanthins, rather than of the uric acid, is responsible for the general symptoms of gout. The uric acid which is now known to be formed only in the kidney and when found in the blood is reabsorbed from that organ, enters into combination in the blood to form the biurate of soda which for some unexplainable reason is deposited in the joints. The symptoms of lithemia and of certain forms of neurasthenia are also due to the retained xanthins and not to the uric acid. Hence neurasthenia, lithemia and gout have many features in common, auto-intoxication being the chief. The uric acid is significant only in one of these, namely, true gout, in which it goes toward the formation of the arthritic deposits. The retained toxins, especially the xanthins, are responsible for the general complexus of symptoms characteristic of all three diseases.

Upon this theory it is an easier matter to explain the numerous bizarre features of these three sets of diseases and to account for the variableness of the results ofttimes obtained from similar treatment in apparently similar cases. In elaborating these ideas in the early half of this paper Dr. Mettler refers to some of the more recent studies upon uric acid, quoting largely from Futcher, Neusser, Kolisch and others. Cases were then cited to illustrate the neurotic nature of the diseases in question and the extreme difficulty of deciding whether the neurotic constitution is the cause or the result of the so-called lithemic state. In the case of the 12 year-old child the lithemic condition was especially pronounced and its amelioration naturally ameliorated the neurotic manifestations, nevertheless there was a marked neurotic inheritance and there is every evidence that this underlying vicious nervous apparatus was the primary cause of both the lithemic and neurotic manifestations. The latter half of the author's paper enumerates some of the principal neuroses associated with the gouty diathesis. Among these neuroses the author has seen cephalalgia, epilepsy, cardiac arrhythmia, chorea, convulsions, vertigo, pain including neuralgia and psychic pain or mental depression, hysteria, exophthalmic goiter, asthma, nervous dyspepsia,

diabetes, facial paralysis, multiple neuritis and sciatica, cerebral apoplexy and aphasia. The aphasia case referred to was especially pronounced. In a case of nervous prostration on the road to recovery an acute attack of rheumatoid arthritis in the right shoulder suddenly supervened. As the rheumatic pains were about to subside under the vigorous use of the salicylates, distinct amnesic aphasia occurred for three days. There was complete loss of the names of things (nouns) so that the patient would begin a sentence with one or two simple words and then suddenly stop with evident dissatisfaction at her inability to speak. With this there were slight delusions and illusions and such hallucinations as the hearing of footsteps and bells that did not exist. It could not have been the medicines employed that gave rise to these manifestations, for though the treatment was continued the aphasia, etc., terminated gradually the third day.

It will then be seen that the author agrees with Haig and Munchison in assigning lithemia as a cause of many neuroses, but he differs from them in giving credit to the retained xanthins rather than to the uric acid.

PRACTICAL NOTES.

Artificial Menopause Induced by the Snegulrev Steam Treatment of Menorrhagia.—Baruch reports a case of severe menorrhagia promptly cured with the steam treatment, but followed by the symptoms of the menopause, although the patient was quite young, II-para; eighteen months later the uterus was found hard and small, the fundus adherent and retroverted, the cervical canal completely obliterated.—*Sem. Méd.*, February 9.

Electrotherapeutic Treatment of Painful Fissure of the Anus.—The *Bull. de la Soc. d'Electrotherap.* for February, contains a detailed description of the remarkable cures effected by Professor Doumer in eleven cases of extremely painful fissures with obstinate constipation and hemorrhoids, with from two to four local treatments with the "high frequency" current. Relief was immediate, the sphincteralgia diminished, the fissures healed over and the constipation and hemorrhoids subsided.

Treatment of Impetigo with Frankliniization.—Fourteen cases rapidly cured with "electric effluvation" are reported by Doumer and Levezier of Lille, all children from six months to 12 years of age, accompanied by marked improvement in the appetite and health. The seances were repeated three times a week, lasting ten minutes each time, two to eight being generally required, and a machine powerful enough to emit sparks eight centimeters in length.—*Sem. Méd.*, February 9.

Thallium Acetate in the Night Sweats of Phthisis.—Combemale has obtained fine results with a single pill containing ten centigrams of thallium acetate administered about an hour before the sweats usually appear. The effect is quite lasting, and the drug must not be given longer than four days at a time, with an interval of eight days before commencing again. The chief accident observed from its use was a sudden alopecia, which requires supervision.—*Prog. Méd.*, February 26.

Treatment of Professional Eczema of the Fingers.—Edlefsen has been very successful for years with the following solution, with which the hands are painted once or twice a day and gloves worn for a while: Metallic iodin 10 centigrams, potassium iodid 25 centigrams, glycerin 12.5 grams. Especially effective in curing eczema due to repeated contact with water. Rózsás states that the direct application of lunar caustic after moistening the parts, will cure rebellious cases of professional eczema, the excess neutralized in a few moments with salt solution and after being wiped dry, the following salve applied: Salicylic acid 2 grams, zinc oxid and talc powder āā 24 grams, and yellow vaselin 50 grams. For external use.—*Sem. Méd.*, February 9.

Contagion of Chancre by Caustic Pencil.—A healthy 12 year-old lad, son of healthy parents, was treated for a polyp in the right nostril by a physician who cauterized it a few times with molded nitrate of silver, which in this case fully deserved the name bestowed upon it by the Germans, "hell-stone," as its use was followed by typic syphilitic infection, soon destroying the tip of the nose, nostrils and septum, when its course was arrested by antisyphilitic treatment.—*Deutsche Med. Woch.*, February 10.

Perpetually Sterile Bandage Box.—The bandage roll is placed in a small metal box with tight fitting metal cover. Between box and cover there is a narrow slit through which the end of the bandage emerges like the tape in a winding tape-measure. No space is left around the bandage strip, which pulls out with moderate effort. The protruding piece is cut off and thrown away, and the following portion of the bandage is found permanently sterile, as no bacteria can find their way into the air-tight box, which does not require to be opened until the last scrap of the bandage roll has been used up.—*Deu. Med. Woch.*, March 3.

Dangers of Artificial Respiration.—Brosch has described a case of sudden death in which artificial respiration was practiced, and at the necropsy the bronchi were found filled with the contents of the stomach. This can be easily accomplished in the cadaver, and is possible in the limp condition of drowning persons. To avoid all danger from this source, M. Buch advises first wiping out the mouth with the finger wrapped in a cloth, and then in the course of the artificial respiration avoiding all pressure on the stomach, confining the efforts to lateral pressure.—*Deu. Med. Woch.*, March 3.

Iodin Injections for Malarial Hypertrophied Spleen.—Parona considers hypodermic injections of the following solution the simplest and most effective treatment for hypertrophied spleen of malarial origin at our disposal to date. Metallic iodin, 25 centigrams; potassium iodid and guaiac āā 2.5 grams; pure sterilized glycerin, 25 grams. Inject one gram in the flank or back, the patient remaining in bed during treatment, suspending it as the organism becomes saturated with iodin. Four cases of enormous tumefaction of the spleen are reported practically cured, although one case required splenectomy later, on account of the mobility of the organ.—*Sem. Méd.*, February 9.

Rapid Process of Double Staining the Blood.—A drop of the blood is placed on a cover-glass and with it a drop of simple sterilized bouillon, then mixed together with the platinum loop, first passed through the flame and cooled. The mixture is dried and fixed over an alcohol lamp, in less than a minute, the cover-glass placed on a glass slide to protect it from the direct action of the flame. He then stains with eosin and then with methyl blue; the entire technique requiring scarcely five minutes.—*Cron. Med. quir. de la Habana*, xxiii, 23; *Sem. Méd.*, February 26.

Hernias During Pregnancy and Parturition.—H. Fischer has been studying the twenty-four cases on record with eight of his own, and confirms the general assumption that severe hernias under such circumstances are particularly troublesome, although the usual rest, etc., of the women favors the cure of slight pre-existing hernias. He has seen two cases of femoral hernia entirely cured with an English truss and the reclining position during pregnancy, and also cases of umbilical hernia held with strips of plaster, over which a good-fitting bandage was worn. He does not believe in postponing a necessary operation on account of the pregnancy or child-bed, but advises an immediate operation after delivery, without waiting for the collapse from incarceration to supplement the operation shock, always using the Schleich method on account of the danger from vomiting after general narcosis, which produced abortion and death in one of his pregnant cases.—*Deutsche Med. Woch.*, March 3.

THE
Journal of the American Medical Association
PUBLISHED WEEKLY.

SUBSCRIPTION PRICE, INCLUDING POSTAGE:

Per Annum, in Advance $5.00
Foreign Postage 1.75
Single Copies . . . . . 10 Cents.

In requesting change of address, give *old* as well as new location.
Subscriptions may begin at any time and be sent to

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No. 61 Market Street (Occidental Buildings), Chicago, Illinois.

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SATURDAY, APRIL 9, 1898.

THE ASSOCIATION OF THE MILITARY SURGEONS OF THE UNITED STATES.

The events of the day are the strongest possible indorsement of the necessity for such an organization as that of the Association of Military Surgeons of the United States. In fact, the medical officers of the various branches of the military and naval services of the country are not associated as they should be, or in any way, officially or nominally, in one harmonious whole. The enthusiastic founders of this body, first and foremost among whom was our own illustrious NICHOLAS SENN—then Surgeon-General of Wisconsin, and now, and for long, we hope, Surgeon-General of Illinois—wisely foresaw that military surgery could not attain its highest development if left to the haphazard methods of independent and inexperienced individuals, and they instituted this Association for the improvement of military surgery, and it is evident that this can only be accomplished when the medical departments of every branch of the national defence shall have common methods of operation and interchangeable apparatus and personnel. While the army and navy are the right and left arms of this national defence, it must be borne in mind that the National Guard is the head, trunk and legs, and even though the arms and legs may be lusty and strong, can this be said of the other parts of the military medical body? Is it not the fact that in most of the States of the Union there is no such thing as a medical department of the National Guard?

In every State, it is true, there is a Surgeon-General, who is presupposedly the head of such a department as the Surgeon-General of the Army is chief of the medical corps of the Army, and a Surgeon-General of the Navy, who is the chief of the bureau of medicine and surgery of the Navy Department, but is the Surgeon-General of Maryland, or Virginia, or Ohio, or Georgia ever titular head of the medical department of the National Guard of these States? Is he not really only an ornamental member of the staff of the Governor of the State, appointed by the incumbent of that office without regard to eminent qualifications or previous service and experience, and holding his position only during the gubernatorial term? Has he any official relationship, control or authority over the medical officers of the National Guard of the State? If he is not such a chief or head is it not because there is no department of which he can be chief?

A medical director in a certain important State of the Union, whose title to the medical directorship arose only from his being the senior medical officer of a brigade, when asked concerning his preparations for active service in the event of the brigade being called into service, as had actually twice happened, explained that he had an arrangement with an apothecary in the city of his residence, who engaged to supply him with such stores and appliances as he thought he might require. There was no State medical purveyor's office, no central depot of ambulances, no bureau of supplies of surgical and medical equipments, no organized hospital corps and no field hospital appointments; and what is true of this State is true of most others.

The Association of Military Surgeons of the United States is aiming to remedy these lamentable deficiencies by inducing the organization of a medical department in the National Guard of each State upon a uniform basis with the medical department of the Army and Navy, having (1) a *personnel* in which admission shall be gained only after a rigid physical and professional examination as assistant surgeon (or better, junior surgeon, for the title assistant is considered a misnomer in the national services) with assured promotion based upon merit and length of service from the lower to the higher grades, the Surgeon-General being selected for his eminent fitness from the medical directors or brigade medical officers and to be the head of a corps in which all the officers are associated and related as parts of a military whole; with (2) an organized *hospital corps*, enlisted and drilled for field service especially; and with (3) a central *depot of supplies*, including ambulances, field (skeleton) hospitals, surgical apparatus and appliances and medical stores, for issue and distribution on approved requisitions.

The advantages, and in fact, absolute necessity for such a uniform system are self-evident, and just as the title, National Guard, implies a community of purpose, its medical department should be in all respects and in every State one and the same, the State initials, like the letters U. S. A. and U. S. N., alone indi-

cating local relations as to source, responsibility and immediate control. It is to be hoped, therefore, that the appeal of the President and Secretary of the Association of Military Surgeons to the governors of the several States to send officially delegated representatives to the annual meeting at Kansas City on June 1, may meet with a general response, inasmuch as the occurrences of this year have demonstrated the need for just the objects the Association aims to accomplish. It is fortunate that the several special committees appointed at the Columbus meeting last year, to consider these questions of uniformity of organization and methods, are expected to report and from the high character and experience of the chairman and members of these committees, it may be expected that something definite may be evolved which will not only be of interest and value to all the States represented, but may result in the establishment of a well-organized and well-equipped and outfitted medical department all over the United States, rendering unnecessary in future cases of hostile operations the philanthropic assistance of sanitary commissions, Christian aid societies and other volunteer bodies. The axiom that there can be no efficient military establishment without a properly organized medical department was never better illustrated than in the recent wretched Greek fiasco, which was an object lesson of the helplessness of an army in which a medical department was considered a mere civil appendage, if, in fact, it was given any consideration.

THE DECREASING FREQUENCY OF TYPHOID FEVER.

There is perhaps no subject more interesting to the devotee of hygiene or the practical physician than the study of the frequency and mortality of diseases which occur with such constancy that all persons in all sections of the country are liable to be affected by them. It is a well recognized fact today that several of the great endemic and epidemic diseases of earlier centuries are decreasing in frequency and virulence and this decrease is of course largely due to the maintenance of strict modern quarantine, better knowledge of the means by which diseases are spread, and the institution of proper regulations controlling the individual who is afflicted. Other diseases more chronic in character, producing grave ravages throughout the human race by slower progress, as for example syphilis, are also known to be decreasing in frequency and virulence, and physicians of many years experience are constantly remarking upon the fact that syphilis in its malignant forms is rarely met with, at least as compared to its frequency twenty or thirty years ago. This decrease in syphilis is partly due to the fact that physicians understand the methods that should be used in combatting it far better than they did in the early part of the century, and, again, the pharmaceutic fraternity working in league with chemists have produced preparations of the great specifics for these diseases in such forms that they can be readily administered and utilized by the physician in a manner which is impossible with crude pharmaceutic products. It is true that the "great white plague," tuberculosis, still reaps its harvest with a frequency and constancy which is most disheartening to those who come frequently in contact with it. But one disease of more rapid course as a rule, which has had a high mortality in the past, and to which all persons are subject with a certain degree of constancy, is typhoid fever. There is no doubt whatever that this disease is decreasing in its frequency, its virulence, and consequently in its mortality in nearly every portion of the civilized world. It is unfortunately only too true that it is almost endemic in most of the large cities of the world. But at the same time the number of cases which are affected by it are diminishing in a manner which is almost startling. Less than fifty years ago it was commonly recognized that the mortality of typhoid fever was about 25 per cent.; whereas it is evident now that the mortality varies from 10 to 15 per cent., and in those portions of the world where good drainage and a pure water supply have been provided to the inhabitants of cities, this mortality has been still further decreased, until it is below that which used to be obtained in hospitals in which the very best and most enlightened treatment was carried out. In one of the "Systems of Medicine" which has been recently published, MOSNY is quoted as showing that the death rate of Vienna decreased from 12.05 per 10,000 to 1.1 after a pure water-supply was provided that city, and a similar decrease has also taken place in Dantzic. In Stockholm a somewhat similar fall is shown by the statistics of that city.

In Munich the mortality has fallen from 334 per 100,000 inhabitants in 1858, the highest mortality which that city has had during the last fifty years, to 3.4 per 100,000 inhabitants in 1896. In London the last twenty years has seen a drop from 267 deaths in the million to 161. In Manchester from 450 in the million to 250, and in the whole of England the death rate has decreased from 1228 per million in 1838 to 137 per million in 1892, and this in face of the fact that the rules of health boards in regard to the notification of diseases are maintained and obeyed better and better as each year goes by, and that the training of physicians and the increasing aids to diagnosis probably result in the reporting of more cases of obscure typhoid than have ever been reported before.

BILLINGS tells us that in Norway from 1888 to 1891 the mortality was less than 10 per cent. In the present Maidstone epidemic in England it is 8.5, and in France it has fallen from 21.5 to 13.5 per cent.

In our own country the mortality of this disease has decreased in Boston during the last fifty years

one-third; in Philadelphia one-third and in New York almost one-half.

Naturally we would expect from this showing that the frequency of the disease would probably be very much decreased, and this is shown in the health records of a number of the cities which keep sufficiently careful records to afford us valuable information in this respect. In New York and Philadelphia, for example, the frequency has decreased almost one-half, and an examination of a number of individual hospital records shows a corresponding improvement.

The next question which arises, is to what is this much desired result to be ascribed? Is it that the present generation are gradually becoming immune to a disease which has seriously affected their forefathers, or that medical skill has improved to such an extent as to cause this vast improvement in life-saving, or, finally, are we to attribute these beneficent changes to a diffusion of knowledge in regard to the means by which this malady is spread, a diffusion which has been as necessary amongst the body of the profession as it has been amongst the laity, both of which classes are at the present time beginning to realize to the fullest extent the amount of pain and suffering and death which can be put aside by the use of even moderately severe measures looking toward the disinfection of discharges, the avoidance of the contamination of water-supplies by the sewage and the carrying out of those simple rules of hygiene with which even the poorest should be familiar. Admitting that the first two possible causes are exciting factors in producing the results which we have named, it is an undeniable fact that to the hygienists belongs the credit for the marked changes which have occurred. Immunity acquired through heredity is theoretically beautiful to contemplate, but practically scientific analysis and the best informed physicians are willing to admit that while a certain number of lives are saved by the employment of rational methods in the treatment of enteric fever no such decrease in mortality as has occurred can be attributed to improved therapeutics. Some one has well said that every death from typhoid is a case of homicide, for undoubtedly it has been proved by bacteriologic research and by frequent experiment upon enormous bodies of people that each case of typhoid could have been avoided by proper disinfection of the discharge of a patient who has disseminated the poison, by proper treatment of the ingesta taken by the individual. Under these circumstances it is evident that physicians should not only use ordinary means to destroy the bacillus of Eberth in every case of typhoid fever to which they are called, but that they should impress by every means in their power upon their patients and upon the popular officials the necessity for preventing this disease by means which are so easily carried out, and so blessed in their results that he who ignores them is guilty of the gravest sort of mistake.

MIGRAINE AND EPILEPSY.

The pathologic etiology of migraine has been long enough the subject of speculation, but we are still in the phase of conjecture or at least theory; our positive acquisitions of knowledge as to the essential pathologic process are so far practically nothing. The notion that it is a vasomotor neurosis has been largely abandoned, and neurologists at the present time are inclined to class it with epilepsy as a fulgurant cortical neurosis, a symptom of cortical instability associated, it may be, with some conditions of morbid metabolism, such as the uric acid or arthritic diatheses. While it may be assumed that it is a derangement to some extent of the function of the sensory cortical elements due to various irritations arising from the digestive organs, the sexual apparatus, the general or spinal sensory tracts, etc., etc., its ultimate cause must be looked for somewhere back of all these in some more profound systemic condition, the exact nature of which we are only able to conjecture at the present time.

Dr. B. K. RACHFORD, who has, during the past few years, advocated the theory of leucomain poison as the essential cause of this disorder, publishes in the April issue of the *American Journal of Medical Sciences*, a further paper on the subject reiterating his former views and supporting them by additional arguments and facts. His former findings of xanthin and paraxanthin in the urine of sufferers from migraine, have, he states, been confirmed by continued observations during the past two years, especially as regards the latter. In normal urine paraxanthin is present in too minute a quantity to be readily detected, and this is true also of that secreted in ordinary attacks of headache, which have not the clinical features of what we recognize as migraine. He does not, therefore, believe that cephalalgia is itself necessarily or directly associated with this excess of paraxanthin; it is the special condition that gives rise to the peculiar migrainous attack. An over-production and accumulation of this product in the blood from some recondite neurotic condition appears to be his theory, and the migrainous explosion is the attendant of its periodical excretion. It is the most toxic of all the leucomains of the uric acid group, and some of the symptoms it produces are suggestive of those of migraine. From all the data thus far obtained, Dr. RACHFORD deems it reasonable to assume that paraxanthin is to be considered as an important factor, at least in the production of true migraine.

The relations of epilepsy and migraine suggested in the theory stated as just now prevalent, are quite strongly suggested by certain clinical facts familiar to neurologists and to whoever has any extensive experience with these neuroses. Epileptiform migraine with loss of consciousness, more or less complete, in some of the attacks, and even with convulsive manifestations, is a well known condition, and the disorder has

unquestionably a close relation with the more formidable affection, as do also certain forms of vertiginous attacks, themselves apparently related to migraine. The pathology of epilepsy, considered as a disease of itself, is also obscure, but when it is reckoned only as a symptom of various pathologic states it is possibly more comprehensible, or at least more easily explained in a theoretic way. Dr. RACHFORD makes this point in his paper and indicates the distinctions between organic or mechanical, reflex and toxic epilepsies, the first being readily comprehensible, the second due to lack of inhibition from defective development due to inheritance or malnutrition, and the last as yet imperfectly understood, but probably not the least in importance of the three general types. As a special form of toxic epilepsy he recognizes that from paraxanthin intoxication, which according to his investigations forms a small but appreciable proportion of the whole class, and has some special features of its own, though hardly enough to characterize it clinically as a definitely marked type. It is more common in women than in men, in middle than in early life, and always in cases that have suffered from, or are still subject to, migraine, thus indicating clearly the common causal factor. It is compatible with unimpaired intellectual powers, thus differing from most of the other forms of epilepsy, and is generally more amenable to treatment, thus rendering an early diagnosis the more important.

It would appear from the facts that RACHFORD has collected that there is a common cause in certain cases of epilepsy and of migraine, and that, as he is inclined to believe, this is to be found in the toxic action of certain leucomains of which paraxanthin is probably the most important. That these do not invariably cause epilepsy or migraine may be admitted, but that is one of the very common facts for which we can have as yet no explanation, and which does not vitiate the conclusion that there is sometimes a causal relation between their occurrence and that of these disorders.

There are undoubtedly other autotoxic factors in epilepsy, those, for example, from the intestinal organs, and the analogy of drug epilepsies is sufficient to make this probable. It is an interesting fact, none the less that we can in this way find a plausible explanation of the long recognized affinities of migraine and epilepsy, and the line of investigation here indicated is well worthy of being further followed out. It may throw light not only on the causes but also on the essential lesions and the practical questions of treatment and prophylaxis.

THE CARDIO-VASCULAR SYSTEM AND ITS RELATIONS TO DISEASE.

A well-known clinician of wide experience in scientific medical societies once remarked that the two most active societies devoted to the study of pathology were to be found in London and Philadelphia. Whether this be true or not matters little, provided either of these bodies provides the general profession from time to time with the results of their studies in such a form that there is direct benefit to physician and patient. Such a function we think was performed by the Philadelphia Pathological Society when at a recent meeting, it devoted its attention to the presentation of a symposium on the "Pathology of Diseases of the Cardio-vascular System," which contained contributions upon the pathology and morbid anatomy of the heart, vessels and blood. Perhaps the most interesting of these papers was that of PACKARD, who dealt with vascular changes and who pointed out ("Transactions of the Philadelphia Pathological Society," March 15, 1898) that not only do we grow old in proportion to our vascular changes but that arteries are vessels which are not only subjected to insults from the exterior but also very often have to carry blood which is capable of exercising harmful effects either from its chemic characteristics or by reason of its containing bacteriologic infections. PACKARD calls attention also to several communications, made recently to medical literature, which he thinks indicate that the endarterium is perhaps equally susceptible with the endocardium to infectious processes or at least inflammatory changes. In the *Bulletin et Mém. de la Soc. Méd. des Hôpitaux*, for Oct. 28, 1898, THOINOT and GRIFFON reported a case of a woman of 53 years who suffered from several attacks of erysipelas of moderate local severity, but severe systemic manifestations from which she eventually died some weeks after the last admittance to the hospital. The autopsy showed old and new lesions in the aorta, the latter being composed of fibrinous, gelatinous deposits of amber-yellow material slightly elevated above the aortic surface. These plaques were formed essentially of a fibrillary substance running parallel to the axis of the vessel, and masses of cells penetrated the internal coat of the vessel as if arranged about a blood vessel. Further the degenerative processes extruded into the media and adventitia, in which near the changes in the intima were areas of intense inflammation. In another instance, recorded in an abstract in the *Gaz. hebdomadaire de Méd. et de Chir.*, Oct. 8, 1897, by ISELIN, a man of 54 years, after exertion, was seized with pain at the base of the neck and severe dyspnea. Death came suddenly and a clot was found plugging the left subclavian artery, and the entire thoracic aorta was the seat of acute aortitis with great thickening. There were no other morbid changes elsewhere save early tuberculosis at the apices of both lungs. Then again we may quote the experimental studies of BOINET and ROMARY (*Arch. de Méd. expérimentale et d'Anatom. pathologique*, 1897, p. 902). These observers injected various micro-organisms into

the blood stream and thereby caused aortitis after producing aseptic trauma of the intima. They found that Eberth's bacillus, the bacillus coli communis and streptococci all caused aortitis when so injected, nor did they stop here but also discovered that anthrax bacilli and tubercle bacilli produced similar effects, as did also those of tetanus and diphtheria. Again the toxins of diphtheria, of streptococci and of the bacillus of tuberculosis, when injected caused aortitis, as did that of cholera. Various metallic poisons did likewise.

These instances combined with three cases examined in which human beings were the victims of infection seem to prove very conclusively that PACKARD'S belief in the susceptibility of the endarterium is correct and, if more evidence be needed to prove the fact, we find LEVY (*Archives*, as already quoted for 1896), recording a case in which a grayish tubercle was found in the subendothelial layer of the aorta, and STROEBE (abstract in the *Centralblatt für Allg. Path. und Path. Anat.*, Nov. 1, 1897) reporting the case of a boy, with general miliary tuberculosis, who had a caseating polyp of a tubercular nature in his ascending aorta. Still further proofs are found in the case of a burned child mentioned by HOLLIS, whose aorta was found at the postmortem to be the seat of early atheroma. It is evident that endarterial disease is still, comparatively speaking, an unexplored field, and that it offers one of the most interesting sources from which we can gather new ideas as to the pathology of vascular changes and the perversions of nutrition depending upon them.

CHARAKA-SAMHITA.

We have received fasciculi 17 and 18 of the Charaka-Samhita, translated into English by AVINASH CHANDRA KAVIRANTA, Calcutta, which is the Hindu medical work corresponding to the Hippocratic treatises. (See JOURNAL, Vol. XXI, p. 465.) Section 17 contains a continuation of lessons 5, 6 and 7, which are aphoristic utterances on the body and medicines, including food and drink. In the 18th fasciculus we find less of how diseases are to be conquered by the physician, and first he says: "If an intelligent man, who knows the difficulty, the lightness of all acts, the results, immediate and remote, of acts, and place and time, desires, impelled by proper reasons, to become a physician, he should then, at the outset, select the particular treatise he should take up for study. Divers treatises pertaining to the profession of the physician are in circulation;" and, after a eulogy of the Rishi, a very ancient work, he describes the qualifications of the preceptor, which, he says, should be: "He should be one whose doubts have all been cleared in respect to medical scriptures. He should be possessed of experience. He should be clever. He should be compassionate toward those who approach him. He should be of pure conduct. He should have a practiced hand. He should have all the implements of his profession. He should have all the organs of sense. He should be conversant with the nature of health, of disease, of medicaments, of time, of place, of man, etc. He should be conversant with the tendencies and acts of the healthy and of the diseased. He should be one whose knowledge of the medical science has been supplemented by a knowledge of other branches of study. He should be without malice. He should be without a wrathful disposition. He should be capable of bearing privations and pain. He should be one well affected toward disciples and disposed to teach them. He should be capable of communicating his ideas. A preceptor possessed of these qualifications very soon succeeds in equipping an intelligent disciple for the requisite characteristics of a physician; like a cloud belonging to the proper season, equipping a fertile field for an abundant harvest. Approaching such a preceptor, a pupil desirous of quoting him, should attend on him with heedfulness like one revering one's sacrificial fire, or one's deity, or one's king, or one's father, or one's patron. Then study the entire treatise through his grace. The pupil should duly strive to comprehend the relations of the different parts toward one another and of each part toward the whole; to understand the consistency and correlation of the words employed to apprehend the sense of the author and to acquire facility of exposition."

The means for achieving these ends are, as follows: "Study, teaching and conversations.

"The following is the method to be observed in study in health and observance of the rule regarding time: The pupil should rise at daybreak or a little before, going through the necessary morning rites, performing his ablutions and bowing under the deities, the Rishis, the cow, the preceptors, those venerable for age, those that have been crowned with success, and professors. Then, seating himself down at his ease on a level and clean spot of ground, he should repeatedly cite the aphorisms in due order with his mind set on the recitation."

CHARAKA advises the preceptor, who will set his mind on teaching, to examine the person that presents himself for becoming a pupil. The disciple should be as follows: "He should be of mild disposition; noble by stature; not mean in acts. His eyes, mouth and nasal lines should be straight. His tongue should be thin, red and unslimy; his teeth and lips should have no deformity. He should not have a nasal voice. He should be possessed of intelligence; free from pride, with a large understanding, power of judgment and memory, and a liberal mind. He should belong to a family the members of which have studied medical scriptures, or followed medicine as a profession. He should have a devotion for truth; his senses per-

fect; free from haughtiness, disposed for solitude, and a thoughtful disposition. He should not be defective in respect to any limb. He should be free from wrath, fond of study, devotedly attached to both theory and practice; free from cupidity, without sloth, and should be endowed with excellent character, purity of behavior, devotion, cleverness, compassion for all; should seek the good of all creatures, and should be prepared to obey all the commands of his preceptor, to whom he should be attached. One adorned with such qualifications has been declared to be worthy of acceptance as a pupil."

We fear that some of our modern medical students would find it difficult to compete with the ancient Hindus in possession of these very moral attributes. This fasciculus is of very great interest not only to the medical historian, but to Hindu scholars in general.

THE WEEK IN CONGRESS.

With the exception of the rather tedious speech of Senator CAFFERY recommending his bill, sanitary matters received little attention. Estimate of deficiency in the appropriation of the Quarantine Service was received in the House and referred to the Committee on Appropriations. The naval appropriation bill is under consideration.

CORRESPONDENCE.

The Serum Treatment of Tuberculosis.

DENVER, COLO., March 29, 1898.

To the Editor:—I note in your last issue a criticism of my report of cases, published in the JOURNAL of March 19, by Kenneth W. Millican, M.D., B.A., M.R.C.S., which I feel deserves a reply. Dr. Millican states that antiphthisic serum T. R. (Fisch) "is recommended in the so-called pre-tubercular stage, in the first stage and the early part of the second stage prior to disintegration and in these alone." He criticises the report sharply, because all the cases were chronic cases and not applicable to serum treatment. The Doctor has forgotten that in the February 5 issue of the JOURNAL there appeared two articles on the treatment of tuberculosis with antiphthisic serum T. R., in which sixteen cases were reported, of which fourteen were chronic cases, having existed from one to eleven years, and yet no criticism was made on account of their not being appropriate cases. Why? Was it because the reports were more favorable?

It was because I believed that the deductions drawn from these cases were not justified that I reported my cases, feeling that not only the "truth, but the whole truth," should be recorded. I admit that in reporting these cases more could have been added in the way of detailed account of symptoms and physical signs, but in practicing brevity, which is the chief value of many papers, something may have been omitted that would have rendered the case clearer to the critical mind. Dr. Millican decides that all, except possibly one or two cases, were cases of mixed infection. In reply I would say that in only one case were streptococci found in addition to tubercle bacilli upon commencing treatment, and this was the only case accompanied by fever and other symptoms of mixed infection.

It is not only proven, but admitted, that the serum treatment is a failure in long-standing chronic cases of tuberculosis. The question remaining is whether incipient or early cases will recover in spite of the remedy or whether it hastens recovery. As early cases invariably recover, and indeed many of the later cases, by proper climatic treatment it must therefore remain with our Eastern colleagues to solve this problem. I would, however, sound this warning far and near. Do not keep incipient cases on serum treatment until all chances of recovery from a change of climate has passed in perhaps the vain hope that they may be cured by this means. Test the serum treatment on those who can not make the sacrifice incident to a change of climate. All early cases that can possibly make the sacrifice send westward, until the full value of this treatment has been proven and you will never regret the results.

Very truly yours, F. E. WAXHAM, M.D.

Homing Pigeons as Medical Messengers.

ELIZABETH, ILL., March 31, 1898.

To the Editor:—For several years the undersigned has had under consideration homing pigeons as medical messengers. My correspondence with doctors who use them for this purpose, and also information obtained in medical journals and books bearing on the subject, so encouraged me that I was induced to invest in some of the "Belgian Homer" pigeons, and now have established a loft of aerial messengers as part of my equipment as a medical practitioner.

The young birds now under training encourage me to say to the JOURNAL readers that my expectations have not been dimmed, and I am convinced that if medical men will look into this matter, if they have not already done so, they too will find it feasible. In order to have the homer pigeon serve me in an efficient manner, I am having the entrance to the loft connected with electric bob-wires, so that when a bird returns home with a message from a patient, the alarm will be given at my office and residence, just as soon as the bird returns and is passing under the bob-wires into the loft.

Just inside the bob wires is a cage or box, placed in such a manner as to make the pigeon messenger a prisoner until the message is secured. Professor Marion of the U. S. Navy Academy has invented a capsule in which the message to be sent is placed, and then the capsule is fastened to the pigeon's leg.

The loft need not be expensive; a space in the barn eight by twelve feet and six feet high and about ten feet from the ground is room enough for thirty homing pigeons. If a special house is constructed, for want of room in the barn, the writer had constructed a loft as follows: Size, six by eight feet with eleven feet studding. Five feet from the ground a floor was placed, leaving the up stairs, or loft proper, six by eight by six feet. The down stairs is inclosed with poultry wire; the up stairs, first with tar paper, then ship lap. Trap doors through the floor permit the birds to come down to the ground, a much needed recreation for the old birds that can not be given their liberty, since they will leave you if an opportunity presents itself. It is the young birds hatched from your loft, or those you get when just old enough to ship (about six weeks old), that can be trained for messenger service, when three or four months old, by taking them several miles from their loft, east, west, north and south, and let them fly back home. This is to be repeated and each time the distance increased, until the remarkable distance of 100 to 1000 miles may be attained, at the rate, for the shorter distances, of an average speed of one mile per minute.

Fraternally,

PHILIP ARNOLD, M.D.

Strongylus Gigas. One More Case.

CHICAGO, March 30, 1898.

To the Editor:—Anent the report in the JOURNAL of March 26, my own observations may be of interest. In 1854, while

residing in St. Louis, early in the spring my husband, then an animated amateur huntsman, complained of sudden darting pains in the region of the kidneys. They would however not persist, but give way to a rather dull ache and come and go. Then at once he became chilled and felt very sick. Our physician pronounced it malaria, contracted on his hunting grounds in the so-called bottoms of Illinois opposite St. Louis. He and his friends had been in the habit of drinking the water of the brooklets in the bottoms, though "disinfected" by whisky, as they thought. Soon he became delirious, diarrhea and hemorrhage from the bladder set in, and consultation was obtained. The second doctor, an old resident of this country, pronounced it bilious fever of the worst form. Indeed, excessive hemorrhage from the bowels, bilious vomiting and high fever took his strength rapidly away. However, he pulled through, and as soon as he was able we removed him to the so-called "bluffs," near St. Louis, in Illinois. The people there had no other water then a strong sulphuretted well, and in the second week of our stay he complained of trouble in urinating, and after several efforts, passed a worm about five to six inches in length; in the course of several days, five or six more of various length. I immediately recognized them as *strongylus gigas*, well described in Aken's "Natural History," as occurring in the kidney's of animals. I had found them in swine kidneys before.

Did this parasite cause the whole affair? Did he drink the eggs with brook water? Did the sulphur water drive them off? Very likely; we never observed any after that.

Respectfully, ROSA H. ENGERT, M.D.

Concerning the Norway Lepers.

PARIS, March 19, 1898.

To the Editor:—In reply to Dr. Hansen's letter in the JOURNAL of February 26, I would say that I got my information as to the number of lepers in Norway from a guide book (I believe Murray's), which I thought at the time was reliable, but which it seems was not.

Now the information as to the other points in my letter, including the number of lepers that Dr. Hansen saw in America, and our profound ignorance, as a profession, of the whole subject of leprosy, I got from an attending physician in the Bergen hospital.

Up to this time, I did not know that Dr. Hansen had ever been in the United States, or that he was the eminent authority on this subject that he is.

I had before seen considerable of leprosy in the East, in its worst form, but it was only after I visited this leper hospital at Bergen that I appreciated the many different phases in which the disease may manifest itself. I am quite willing to classify myself among those who know very little about this terrible disease. Yours truly, W. S. CALDWELL, M.D.

Anemias.

CINCINNATI, April 3, 1898.

To the Editor:—It was with pleasure that I read your editorial upon "The Differentiation of the Anemias," but as there was one statement that does not harmonize with my experience, I offer such in the form of a friendly scientific criticism.

You state that the megaloblast is diagnostic of pernicious anemia if it exceeds the normoblast in number. This statement is misleading, as is also your summary, for often we may have a pernicious anemia in which the differential count will not reveal a single megaloblast; when the *megaloblasts exceed the normoblasts* the *prognosis is fatal.*

Recently I made the examination of a case in which there were neither megaloblasts nor normoblasts found but the summary made the diagnosis. The examination revealed the following: Red, 1,200,000; white, 4,000; hemoglobin (Fleishl) 35 per cent.; color index 1.45.

Red cells: poikilocytosis, polychromatophilia.

WHITE CELLS.

Adult.—polymorph. neutrophiles, 33.8 (normal 60 to 70 per cent.)

Young.—(Large mononuclear 1.8, transitional 2.6, small mononuclear 59.4. Total, 63.8 (normal 20 to 30 per cent.)

Old.—(Eosinophiles) 1.8 (normal ½ to 4 per cent.)

Myelocytes.—.6 (normal only in bone marrow).

(The full report of this case appears in the transactions of the Academy of Medicine of Cincinnati published in the Cincinnati *Lancet-Clinic* of March 19, 1898.)

A proper summary for pernicious anemia should be as follows:

Red, 1,200,000 or less; white, less than 5,000; color index, high, above 1.00; poikilocytosis, polychromatophilia.

Increase of young white cells; decrease of adult white cells.

Prognostic: Proportion of megaloblasts to normoblasts.

Respectfully yours,

W. EDWARDS SCHENCK, M.D.

Aut Rush Aut Nullus.

PITTSBURG, PA., March 28, 1898.

To the Editor:—Is it not possible to broaden "The Rush Monument" project into "A Monument to American Medicine?" Rush would still be the central figure, to which could be added medallions, or panels, honoring McDowell, Wells and Sims. It has been repeatedly urged that we are not as loyal to our profession as the homeopaths, who have erected such a fine monument to Hahnemann. But scientific medicine is not founded on any one man, no matter how great he may have been. I feel sure contributions would flow in faster if such a memorial to American medicine was contemplated. The three I have named made discoveries and instituted operations that have revolutionized surgery, and so, surely deserve a place on such a monument. The profession here have recently subscribed $500 to the fund, but I have heard many doctors express a wish that the monument might be wider in its teachings. Respectfully,

THOS. D. DAVIS, M.D.

Esophagostomy vs. Esophagotomy.

PHILADELPHIA, March 29, 1898.

To the Editor:—I find the remarks made by me in the discussion of Dr. Roe's paper in the issue of the JOURNAL (March 26, page 716), as reported, are so at variance with the idea that I wished to convey, that I hope you can find it possible to correct them. I distinctly said that *esophagostomy* is more desirable than esophagotomy, because the dangers of entering the posterior mediastinum are thus removed and we are enabled to remove the foreign body, if there be such, or divide the stricture through the external opening, thereby inflicting the minimum amount of force in the ulcerated region.

Yours faithfully, L. J. HAMMOND, M.D.

Examining Committee Connecticut Medical Society.

NEW HAVEN, March 29, 1898.

To the Editor:—In your issue of the 26th inst., you give a list of the States that require an examination before a State board before admission to practice, but failed to mention Connecticut. You will see by a perusal of the enclosed copy of our State law that an amendment, approved by the Governor on May 25, 1897, provides that no one can now begin to practice medicine in this State without passing an examination before one of the examining committee, diploma or no diploma.

Very truly yours, MAX MAILHOUSE, M.D., Sec'y
Examining Committee of the Connecticut Medical Society.

PUBLIC HEALTH.

The Colored Race in Life Assurance.—The Atlanta University has examined into this subject and issued a pamphlet giving statistics of results. In general, the conclusions are as unfavorable as those that have formerly been made public. The prevailing causes are scrofulous, infantile and pulmonary diseases, the following comparison being from Richmond, Memphis and Charleston combined; by consumption and pneumonia the colored showed a rate of 75.5 as compared with white 32.8, being an excess of 130.5 nearly. In fevers, as typhoid, scarlet, malarial, etc., the excess was 30 per cent. on the same side; in cholera infantum, convulsions, etc., it was 165.1. Consumption and pneumonia thus appear the most deadly. As to the former alone, the percentage of excess of deaths per 10,000 in case of blacks over deaths of whites, covering periods of four years each, from 1881 to 1895, was from 143 to 172 in Atlanta, from 90 to 137 in Memphis, from 162 to 239 in Charleston, from 128 to 149 in Baltimore and from 87 to 114 in Richmond. This is an unhappy condition, but not necessarily a hopeless or even a discouraging one. The evolution of the long depressed race must be slow, but it is none the less sure under environments that are no more unfavorable than we know them to be in the area of this inquiry. The Prudential Company has had an experience in both equal and discriminated insurance for blacks and whites. For a term of years it has been in the habit of giving one-third less insurance, for the same money, to colored than to white "adults," or 12 to 70 years. During the period in question mortality was separated and tabulated by color and special search and study among health reports and census reports was made. From 1884 to 1893, inclusive, the company's experience showed an average loss per $1000 at risk of $16.96 among whites and $21.63 among blacks. The causes were found to be four: Comparatively higher actual mortality resulting from lack of physical vigor, inherited tendencies to disease, neglect in sickness, improper food, unwholesome habits of life, unhealthy localities; a heavy lapse rate, in which the "selection" was against the company as usual; a low moral sense; ignorance of its attendant evils, although this last-named cause might seem included in the others. Even among the small number of negroes who are thrifty, intelligent and on a high comparative level of moral and social living the Prudential is satisfied that mortality still exceeds that of whites, owing to low vitality and inherited weaknesses of constitution. The Sun Life of Louisville has reported a similar experience and belief, adding that Southern whites object to joining any company which accepts negro risks freely, not from race prejudice, but because they do not believe insurance of the two races on equal terms to be equitable. The lowest of Northern laborers may possibly have as high a mortality as among the negroes, but no proof can be had because the mortality of the low Northern whites is inextricably merged in the general mortality. The negro lapse rate alone would make him an undesirable risk. The reporter of the company believes that the negro generally insures out of vanity and the love of novelty; the notion of a showy funeral impresses him, but wears off in time, when he is ready to drop out; he is with difficulty persuaded to revive an insurance, but readily consents to "join over," often proudly exhibiting as trophies a collection of policies.

The Limitations of Formaldehyde as a Disinfectant.—Dr. Harrington of the Harvard Medical School, recently undertook a series of experiments to ascertain the efficiency of formaldehyde as a disinfectant, its penetrating power under varying conditions and its action on higher organisms. His experiments show that while formaldehyde has extraordinary power as a surface disinfectant, greater than that of any other known substance, it is not absolutely thorough in all cases even as a surface disinfectant in room treatment. The penetrating power of the gas depends largely upon the conditions as to moisture. Through dry pervious substances, as cotton cloth, absorbent cotton, hair, etc., it appears to penetrate more or less easily, but not always in sufficient amount to exert germicidal action, as is shown by the results with the tube cultures and flasks of decolorized fuchsin, which were stoppered in exactly the same manner. In the presence of moisture the penetrating power is practically *nil*. The experiments can lead to but one conclusion, therefore, that formaldehyde must be regarded and employed as a surface disinfectant and can never be anything else, in spite of its power of penetration under favorable conditions. This conclusion is in accord with that of Aronson, Pfuhl, Nieman, Bosc, Roux and Trillat, and Vaillard and Lemoine. It has been asserted by a number of authors, among them Aronson, Pfuhl and Posenberg, that formaldehyde exerts no deleterious action on higher organisms. The results produced by the gas on the two rabbits used in the first experiment were sufficiently certain to demonstrate the falsity of this theory. The experience of several others, who are daily engaged in the work of house disinfection, has shown that animals such as dogs and cats that have accidentally been confined in rooms undergoing formaldehyde disinfection, rarely survive the operation when the latter is properly carried out. On the other hand, the experience of these same persons is that insects such as roaches, flies and bedbugs, are not much affected. His observations in this direction have been limited to the cases of occasional flies, and one dish of cockroaches, all of which were killed.—*American Therapist*, February.

NECROLOGY.

OLIVER ALBERT JUDSON, M.D., Jefferson, 1851, of Philadelphia, who has just died, was a volunteer surgeon during the war. He was a member of the Military Order of the Loyal Legion, the Sons of the Revolution, a Fellow of the College of Physicians, a member of the Academy of Natural Sciences, vice-president of the Pennsylvania Institution for the Instruction of the Blind, a manager of the Children's Hospital, a consulting physician at Blockley Hospital and a physician of the Philadelphia Dispensary and of the Howard Hospital.—*New York Tribune.*

GEORGE STEBBINS LITTLE, M.D., of Brooklyn, died March 30, in his 73d year, of capillary bronchitis and valvular disease. He was born in Middletown, N. Y., in January, 1826. He was graduated at the New York University school in 1848. He was assistant surgeon in the Nineteenth and Ninety-seventh Regiments, New York Volunteers, for nearly two years, and full surgeon of the latter troops until the muster-out at the close of the war. In 1864, he returned to Brooklyn and resumed medical practice. He was a member of the Kings County Medical Society and prominent in Grand Army matters. Since 1894 he had been an assistant sanitary inspector of Department of Health. He leaves a widow and one daughter and a son. His final illness was of about two weeks' duration.

MORTIMER A. R. F. CARE, M.D., Cumberland, Md., March 24, aged 68 years.——F. P. Carter, M.D., Wauwatosa, Wis., aged 26 years.——A. F. Henry, M.D., Alamo, Ind., March 29.——George T. Hough, M.D., New Bedford, Mass., March 24.——E. D. Lipscomb, M.D., New Market, Ala., March 29, aged 34 years.——Carpenter Weidler, M.D., Mechanicsburg, Pa., March 25, aged 70 years.——Hugh Hagan, M.D., Atlanta, Ga., March 22, aged 35 years.

DEATHS ABROAD.—Staff-Surgeon Gottfried Lenhartz, Editor of the *Deutsche militär-ärztlichen Zeitung*.——Max Dahmen, well known by a series of publications on bacteriology, and for many years director of a bacteriologic laboratory at Krefeld.——Franz Lörinczy, Editor of the *Közégeszségügyi Kalauz*,

aged 52 years.——Carlos de Silóniz y Ortiz, Professor of Anatomy in the Medical Faculty of Barcelona since 1847.——Gayraud, sometime Agrégé Professor of Surgery in the Medical Faculty of Montpellier, a former President of the Montpellier Academy of Science and Letters, and author of several important articles in Dechambre's *Dictionnaire Encyclopédique des Sciences Médicales*.——Du Brueil, Physician to the hospitals of Rouen.——A. D'Ambrosio, Extraordinary Professor of Orthopedic Surgery in the Medical Faculty of Naples.

BOOK NOTICES.

The Surgical Complications and Sequels of Typhoid Fever. By WM. W. KEEN, M.D., LL.D.; based upon tables of 1700 cases compiled by the author and by Thompson S. Westcott, M.D., with a chapter on the Ocular Complications of Typhoid Fever, by George E. de Schweinitz, A.M., M.D., and, as appendix, the Toner Lecture, No. 5. Philadelphia: W. B. Saunders, 1898. Pp. 386. Price $3 net.

"The province of the physician and that of the surgeon," say the authors, "are in general sufficiently sharply defined and differentiated, yet they have many points of contact. While some diseases belong exclusively to the province of the one and some of them to the other, other diseases may fall with equal propriety under the care of either practitioner. Still another class of cases from the beginning, in the domain of medicine may terminate in that of surgery, and we may lack a very complete history from the very fact of this division of their care and interest. Among the diseases classed as strictly medical, none deserve the appellation more definitely than the continued fevers, especially typhoid fever; yet the present work shows that these fevers are not infrequently the cause of the gravest and least expected surgical troubles, mention of which is generally omitted even in our best text-books on medicine, still more rarely noticed in works on surgery, and where noticed, it is only with the greatest brevity."

The authors discuss the pathology of the disease, particularly the behavior of the typhoid bacilli outside and inside the human body, and the wide diffusion of typhoid bacilli in various organs and tissues of the body; the results of mixed infection of typhoid bacilli, and pyogenic and other bacteria; the pyogenic faculty of typhoid bacilli; typhoid infection of different organs without typical typhoid lesions in the intestine. Then follows a chapter on typhoid gangrene, giving its state of onset and its pathology. Chapter 4 describes typhoid affection of the joints, such as rheumatic typhoid arthritis, septic typhoid arthritis, typhoid arthritis, polyarticular and monarticular; pathologic dislocation after typhoid fever. Chapter 5 describes typhoid affections of bones. Chapter 6 speaks of typhoid abscesses. Chapter 7 is devoted to typhoid hematomata, of which only a single case is given, but an analysis was made of seventeen reported cases. Chapter 8 deals with the cerebral complications of typhoid fever, and twenty-two cases are analyzed. "It is noteworthy," say the authors, "that a bacteriologic examination was made in fifteen of the cases of meningitis, and without exception the bacillus of Eberth was found in pure culture in twelve." In 2.87 the bacillus of Eberth was found. Chapter 9 analyzes thirty-one cases of otitis media in typhoid fever. Chapter 10 refers to fifty cases of typhoid parotitis, tabulated by Dr. Westcott, and 375 cases in the Toner Lecture of Keen. Chapter 11 refers to typhoid affections of the thyroid gland. Chapter 12, of the larynx, and in the latter it may be stated that necrosis of the cartilages is a most common and most dangerous form of laryngeal infection from this cause. Chapter 13 speaks of typhoid affections of the pleura, lungs and heart. Chapter 14, typhoid affections of the esophagus and stomach. Chapter 15 is devoted to intestinal perforation in typhoid fever. Chapter 16 takes up typhoid affections of the liver and gall bladder. Chapter 17, of the spleen. Chapter 18 of the male and female sexual organs. Chapter 19 is devoted to a discussion of specific mixed infections, such as tetanus, erysipelas, anthrax, malignant edema. Chapter 20, by George E. de Schweinitz, is on the ocular complications of typhoid fever. Chapter 21 gives the conclusions.

For the appendix to the work we are indebted to Dr. Keen and the Smithsonian Institute for the reprint of his Toner Lecture on "The Surgical Complications and Sequels of the Continued Fevers," delivered in 1876, which lecture had a more limited circulation than it is likely to attain as an appendix to this volume. We congratulate the authors on this valuable addition to American medical literature.

Diseases of Women. A Clinical Guide to their Diagnosis and Treatment. By GEORGE ERNEST HERMAN, M.B., London, F.R.C.S. With 252 Illustrations. New York: Wm. Wood & Co. 1898. Pp. 886. Price, extra muslin, $5 net; leather, $5.75.

If every one who wrote a book were as careful that clinical experience should precede the writing of it as Dr. Herman has been, our medical literature would largely gain in usefulness and authority. This excellent work has seven introductory chapters on general topics, such as neurasthenia, hysteria, headaches, pain in the back, chronic abdominal pain and methods of investigation. Part II discusses chronic pelvic pain, such as chronic ovarian pain, chronic uterine pains, subinvolution and chronic metritis, uterine displacements, prolapse, retroflexion, etc. Part III discusses pelvic inflammations, namely, acute general peritonitis, perimetritis, serous perimetritis, perimetric abscess, salpingo-ovaritis and parametritis. Part IV is given to internal hemorrhage, as internal hemorrhages, pelvic hematocele; Part V, general considerations of uterine hemorrhage, hemorrhages without pregnancy or new growth, hemorrhages with round tumor in the vagina, hemorrhage connected with early pregnancy, adenoma of the uterine body, cancer of the cervix, malignant disease of the uterine body, bleeding fibroids; Part VI, general considerations as to leucorrhea, leucorrhea in children, in virgins, in married women, in old women; Part VII, disorders of the vulva, pruritus, inflammation and ulceration, swellings; Part VIII, disorders of menstruation, menstruation; dysmenorrhea, obstructive, membranous, spasmodic and congestive; amenorrhea, retained menses, menstruation absent; Part IX, disorders of the sexual functions, sexual troubles and sterility; Part X, disorders of parts adjacent to the sexual organs, too frequent micturition, painful micturition, retention of urine, incontinence of urine, painful defecation, and incontinence of feces; Part XI, abdominal tumors, ovarian tumors, clinical history of ovarian tumors, diagnosis of ovarian tumors, ovariotomy, after-risks of ovariotomy, solid abdominal tumors, treatment of subperitoneal fibroids, ectopic and complicated pregnancy, inguinal hernias.

It will be seen that the scope of the work is extensive, and that the subject-matter is fairly well covered. It is no disparagement to the many excellent works on the market, to say that this book of Dr. Herman will occupy front rank among them.

Mammalian Anatomy; A Preparation for Human and Comparative Anatomy. By HORACE JAYNE, M.D., Ph.D. Part I. The Skeleton of the Cat, its Muscular Attachments, Growth and Variations Compared with the Skeleton of Man; With Over Five Hundred Original Illustrations and Many Tables. Philadelphia: J. B. Lippincott Co. 1898. Pages 816.

This work belongs to a class of which we have had too few in America, and the manner in which the publishers have brought out this beautiful volume can not be too highly praised. The type is large and clear; the paper is of the best, and the illustrations are in the highest style of the art. This treatise, of which this is the first part, is a monograph on a typical mammal, and is employed as an introduction to general comparative anatomy. The cat has been selected as furnishing a structure of the inferior animals which in certain anatomic respects approaches more nearly to man than a dog, and

is not specialized for any one mode of life, is of convenient size and easily obtained.

The introductory chapter treats of the structure and classification of bones, features, practical methods of study, with an explanation of the general terms used in the description. This introduction is then followed by a systematic study of every bone and the regions which they form when articulated. The description of a bone includes an explanation of its name, the areas for muscular attachment, its articulations, rules for rapid identification, the centers of ossification from which it is developed, its growth and its variations. The corresponding bone in the human skeleton is then carefully compared with it.

Although this volume is complete in itself, yet we shall look with interest and some impatience for the second one.

Proceedings of the American Medico-Psychological Association. Paper. Illustrated. Pp. 380. Published by the Association, 1897.

This volume has to do with the fifty-third annual meeting held in Baltimore, May 11–14, 1897. The papers included are: "Improvements of the Medical Service of Prisons, Reformatories and Penitentiaries;" "A Sketch of Psychiatry in the Southern States;" "Advances in Neurology and their Relation to Psychiatry;" "General Questions of Auto infection;" "Clinical Aspects of Auto-intoxication;" "Demonstration of Various Types of Changes in the Giant Cells of the Paracentral Lobule;" "The Development of the Higher Brain Centers;" "The Genesis of a Delusion;" "The Psychology of Insane Delusions;" "Preliminary Report, Clinical and Pathologic, of a Case of Progressive Dementia;" "Some Observations on the Use of Hyoscin;" "Aphasia, with Report of a Case;" "Hospital Records;" "The Medical and Material Aspects of Industrial Employment for the Insane;" "Insanity Following Surgical Operations;" The Commitment and Detention of the Insane with Especial Reference to the Laws of Maryland;" "Katatonia;" "The After-care of the Insane;" "Training Schools for Nurses in Hospitals for the Insane;" "Myxedema-like Conditions in the Negro;" "The Constructive Forces;" "The Practical Lines of Work Needed for the Advance of Psychiatry." A number of full-page plates in colors add much to the perspicuity of the volume.

Studies From the Department of Pathology of the College of Physicians and Surgeons, Columbia University, New York. Vol. v, part 1. Paper. Illustrated.

This volume comprises reprints of studies made during the collegiate year 1896–97. The studies included are: "Milk as an Agency in the Conveyance of Disease; and Low Temperature Pasteurization of Milk at About 68 C.;" "A Machine for Tubing Bacterial Media;" "A Contribution to the Study of Acute Ascending (Landry's) Paralysis;" "A Further Study of the Biology of the Gonococcus (Neisser) with Contributions to the Technique;" "Bacterial and Allied Tests as Applied to the Clinical Diagnosis of Typhoid Fever;" "Dangers of the Domestic Uses, Other than Drinking, of Contaminated Water, with Special reference to Milk and Oysters as Carriers of Bacteria;" "Report on two Cases of Tumor of the Spinal Cord, Unaccompanied by Severe Pain;" "The Lymphatic Constitution, and its Relation to Some Forms of Sudden Death;" "Notes on Polychromatic Photomicrography, with Plate in Color."

Transactions of the Medical Society of the District of Columbia, Vol 1, 1897. Paper, pp. 243.

This volume covers the period from March, 1896, to January, 1897, and is edited by Drs. W. W. Johnston, G. M. Kober and J. D. Morgan. Sixty-eight papers, the most of them with discussions, and "Arguments Against Bill to Prevent Vivisection," the bill regulating testimony of physicians in courts of the District of Columbia, also the bill regulating expert evidence in courts of the District of Columbia, and the Medical Practice Act are included, with the minutes of the various sessions of the society during the period named.

MISCELLANY.

The Sins of the Pessary.—F. L. Neugebauer has collected 304 cases of injuries from pessaries, and states that in 112 there was perforation of a neighboring organ, the rest due to abuse, neglect, being forgotten, etc.—*Wien. klin. Woch.*, February 24.

Length of Time Carbon Dioxid Remains in the Blood After Intoxication.—Experimental research shows that forty-one minutes is the longest period, and sixteen the shortest, in which carbon dioxid can be detected in the blood of animals exposed to its toxic action.—*Deu. Med. Woch.*, February 24.

Infiltration of the Nerve Cells by Leucocytes.—In the investigation of the tissues of some old dogs it was found that the leucocytes had penetrated into the interior of the nerve cells, especially those of the ganglia of the posterior roots, producing peculiar alterations in the neuron as the leucocyte gradually invaded and destroyed the nerve cell.—*Presse Méd.*, March 2.

Effects of the X-rays on Osmosis.—In some recent experiments the ascent of the liquid was checked almost entirely by the action of the rays from the Crookes' tube. This effect on the osmosis may be the explanation of the alterations produced in the tissues by the X-ray.—*Presse Méd.*, March 2.

Study of Epilepsy.—The formation of a National association for the study of epilepsy and the care and treatment of epileptics is being advocated by William P. Spratling, superintendent of the Craig Colony, Sonyea, N. Y. The Doctor will be glad to hear from any who favor such a society or have any suggestions to offer.

New Publication.—*Medical Libraries*, Vol. 1, No. 1, February, 1898, has reached us. This publication will be issued monthly and is "devoted to the interests of medical libraries and bibliography." Dr. C. D. Spivak, Denver, is the editor, and the subscription price is 50 cents per annum.

Extra-uterine Pregnancy Lasting Twenty-three Months.—A fully developed fetus was exhibited at a recent meeting of the Brussels Anat. Path. Society, which had grown in the tube, in which also the placenta was inserted. After the rupture of the tube the fetus had passed into the abdomen where it had contracted adherences with the intestines and peritoneum.—*Presse Méd.*, February 26.

Mycosis of the Nerve Centers.—J. Roux and Paviot describes in the *Presse Méd.* of February 23, the observation of a case resembling Landry's disease with the exception of a few particulars, but at the necropsy a parasite was found in the nerve centers of the spinal cord and medulla, resembling a streptothrix, which seemed to have affected the nerve centers mechanically by its enormous growth.

Placental Infection of Anthrax.—Rostowzew had occasion to observe three cases of pustula maligna faciei in pregnant women, in the fourth, seventh and eighth month, all fatal. The anthrax bacilli were found in the fetus, showing that there must have been placental infection, although they were much less numerous and paler in color. Under the influence of the infection the epithelial coat of the chorion villi loses it impermeability, so that the bacilli can pass directly through it, as Rostowzew also confirmed experimentally. He notes that this affection seems more fatal to pregnant women, as three similar cases in non-pregnant women terminated in recovery.—*Ztschft. f. Grb. u. Gyn.*, Vol. 37, No. 3.

An Extensive Operation to Remove an Enormous Vesical Papilloma is described in the *Ann. de la Soc. Méd.-Chir. de Liège* of January. It included the total ablation of the genital organs, male, and the total resection of the bladder and urethra, requiring symphyseotomy and a wide opening between the pubes, besides an opening in the perineum. The ureters were implanted in the rectum, with sounds removed forty-eight

hours later, but one of the ureters became partially detached from the rectal wall, causing some of the urine to trickle through the perineal wound. Except for this the patient seems quite restored and has gained in weight during the six weeks since.

Section on Materia Medica, Pharmacy and Therapeutics.—Dr. C. C. Fite, late Secretary of the Section on Materia Medica, Pharmacy and Therapeutics, has resigned. Dr. Leon L. Solomon, 323 West Walnut Street, Louisville, Ky., has been appointed Secretary of the Section.

Papers at the Association Meeting.—Gentlemen intending to contribute papers to the various Section meetings are respectfully informed that by a rule passed by the ASSOCIATION many years ago, all papers read at the meetings are considered the property of the ASSOCIATION and are to be published only in its Transactions. This, however, does not preclude the right to publish short abstracts of the papers in other journals.

Pathologic Anatomy of Hemorrhoids.—Microscopic examination of fifteen cases of hemorrhoids operated on, confirms the assumption that hemorrhoids are not simple varices, but angiomas, complicated secondarily by the venous stasis. The starting point is undoubtedly a local infection produced by intestinal microbes.—*Beiträge z. Klin. Chir.*, xxi, 1.

A Remarkable Leucocytosis in Whooping-Cough is one of the first manifestations of the disease, preceding the coughing paroxysms. Meunier found, in 102 numerations, that the average was 27,800, with a maximum of 51,250; the usual proportions between the lymphocytes and the polynuclear leucocytes reversed. He suggests that this remarkable leucocytosis may be found valuable in differentiating the affection for the prophylaxis of whooping cough in schools, hospitals, etc.—*Presse Med.*, January 26.

Myelocytes in Pneumonia.—W. Türk has recently published the results of a systematic and comprehensive study of the blood in the course of various infective diseases, sixty cases. In regard to mononuclear neutrophile cells, myelocytes, he asserts, that they are especially typic in pneumonia. They are rare during the fever process, but increase always at the time of the crisis, frequently as much as 10 per cent. and over. He noted a new form of cell which he calls the "stimulation" form (Reizungsform), a mononuclear cell distinguished by the fact the protoplasm takes a peculiar brown color with the "triabid stain."—*Wien. klin. Woch.*, February 3.

Rigidity of Anchylosis of the Spine is an affection recently described by von Bechterew for the first time, his monograph being based on the observation of six cases; no necropsies. The anchylosing process affects the bones and later the meninges, causing compression of the roots of the spinal nerves and determining various sensory, motor and trophic disturbances. As the spine becomes rigid it assumes a posterior convex curvature, usually confined to the superior dorsal region. Three of his cases had nervous antecedents and the other three attributed the affection to traumatism. No infective disease nor intoxication could be discovered.—*Deut. Zetschft f. Nervheil.*, xi, 3, 4.

Effect of Extreme Heat on the Nerve Cells.—Experimentation with rabbits exposed to extreme heat showed that the motor cells in the spinal cord were altered, the protoplasmic prolongations tumefied, color changed, etc., and the necropsy of two patients succumbing to tetanus and scarlet fever, whose fever had risen to 102 and 106 degrees, disclosed similar alterations. When the animals survived the heat, the cells were restored to normal in three days.—*Klin. Therap. Woch.*, January 30.

Permeability of the Eschar Produced by the Cautery.—Experiments in this line are reported from both Holland and Germany, in which the ear or peritoneal cavity was cauterized and micro-organisms placed on the outside of the resulting scab. Ten Brink found that the staphylococcus easily penetrated the scab from the hot iron and was found in the subjacent tissues, but Cohn reports that the eschar from nitrate of silver protects the tissues beneath, and also that its bactericidal properties killed anthrax, diphtheria germs and streptococci in contact with it. The eschar resulting from the use of cuprum sulfuricum proved equally effective.—*Nederl. Tijd. v. Ges.*, January 29, and *Berl. klin. Woch.*, 1897, No. 52.

Removal of Large Exostosis During Pregnancy.—W. Kramer reports an unusual case in which a large exostosis had developed on the inside of the pubic bone, closing the canal and rendering a natural birth impossible, when the woman arrived at the hospital already in labor. Cæsarean section was successfully performed and the woman advised to return after a few weeks to have the bony growth removed. She did not appear again for a couple of years, when she was already in the sixth month of a second pregnancy. To avoid interference with the pregnancy, Kramer extirpated the tumor through the pelvic outlet, although this did not allow full inspection by the eye, and curetted the space left on the bone, 5 to 6 cm. in diameter. Dismissed perfectly recovered in a month; normal delivery in due time.—*Cbl. f. Chir.*, March 5.

Europeans not Immune Against the Plague.—The death of an English nurse, Miss Morgan, at the Poona Plague Hospital, from that disease, the death of a European nurse at the Parsee Plague Infirmary, and the severe attack sustained by Dr. H. W. Bruce of Malegaum, together with a number of similar events, have shown quite conclusively that the supposed immunity of whites againsts the plague is not proven. As a general rule, Europeans are so placed as to be under comparatively slight dangers of infection, as compared with the poorer classes of natives, and their habits of life safeguards them from contracting, or succumbing to, the disease. When Europeans are seriously and repeatedly exposed to infection, as is the case with hospital attendants, the frequent occurrence of cases contradicts the supposed invulnerability.

Pathology of Acromegalia.—Strümpell concludes from a case he has been observing for years and from the necropsy, that acromegalia is probably an endogenic affection due to the congenital malformation of certain organs with it remains to locate. The pituitary body has been incriminated by various authors and, in fact, there is scarcely a case on record with entire absence of all tumor of the pituitary body. In the present case nothing abnormal was found outside of the simple hypertrophy of the bones, subcutaneous cellular tissue and of the skin, but a soft tumor, sarcoma, in the pituitary region, which had invaded the nasal fossæ and right orbit after destroying the sphenoid bone. He adds in conclusion that acromegalia can be considered the exact opposite of sclerodermia; one, hypertrophy, the other, atrophy, resembling the antagonism noticed between Basedow's disease and myxedema.—*Deu. Zt. f. Nerv.* xi, 1, 2; *Sem. Méd.*, February 26.

Glycogenesis in Normal and Pathologic Tissues.—In a recent communication to the *Presse Méd.*, January 20, A. Brault proves that glycogenesis is a property inherent to all the cellular protoplasms at different periods of their existence, and although apparently they may have lost it, yet when incited to a more active nutrition they regain this property of elaborating and storing glycogen. The animal cell, he asserts, manufactures glycogen directly, as the vegetable cell manufactures starch, with the difference that it is not indiscriminately produced; it always corresponds to certain distinct nutritive processes. He shows that Claude Bernard was mistaken in assuming the liver to be the sole glycogenetic organ, as he has established that glycogen is found normally in the muscles and cartilages as well as in the liver; it is absent from almost all the other organs. It is, therefore, reasonable to

suppose that it is especially valuable to the liver and muscles, and he considers that the glycogen found stored in the cells is designed for an alimentary reserve, a local provision to be utilized on the spot. His important conclusions in regard to glycogenesis in neoplasms as an indication of their rate of development have already been noted in the JOURNAL (Vol. xxviii, page 1093).

Work of the Muscles in the Pneumatic Cabinet.—G. v. Liebig describes some tests on different persons in which the number of times a given weight could be lifted with the outstretched arm, in pneumatic cabinet (at a pressure of two atmospheres), and also outside, were compared. The tests showed that the muscles could accomplish nearly 50 per cent. more work with the double supply of oxygen, which confirms the experience that miners can do work in the compressed air of the iron mines much beyond their strength outside, and with less subsequent fatigue. A. Mosso believes that the extra supply of oxygen affects the brain also, rendering it less susceptible to the sensation of fatigue. In some lifting tests with the middle finger when the muscles refused to act, he continued the exercise by electric stimulation of the nerves involved, and in a few minutes found that he could continue the exercise without the electric stimulation, which he thinks indicates that it was the brain, the will, that became fatigued, rather than the muscles.—*Deu. Med. Woch.*, March 3.

Pathogenesis of Affections of the Articulations.—The synovial membrane not only differs from other serous membranes by the lack of endothelium, but by a peculiarly rich and elbow-shaped vascularization, according to a recent study by Hofbauer. The capillaries are extremely numerous and penetrate close to the surface, under which they bend and extend in a tortuous course parallel and very close to the outer surface. This arrangement of the capillaries explains the tendency of the articulations to be early involved in the course of any infection of the blood, owing to the great afflux of blood and of the contained irritant substances, leading to accumulations of the microbes or toxins in the synovia and joint. The extremely thin partition is soon traversed by chemicals or microbes, in the same way as they pass into the urine through the glomeruli, although less easily. The contaminated fluid has then no outlet and everything favors the development of the germs, as absorption from the articulations is extremely slow.—*Wien. klin. Woch.*, January 27.

Anytin, the new substance that renders insoluble substances soluble, is obtained from a hydrocarbon containing 10 per cent. sulphur treated with sulphuric acid, then neutralized with ammonia and precipitated with alcohol, which removes all the insoluble elements. The brown sulpho-ammoniacal salt thus obtained (with the addition of 33 per cent. water) has been named anytin by Helmers, its discoverer, and has the property of rendering otherwise insoluble substances in combination with it easily soluble in water. The anytols, as these combinations are called, have been studied by Loeffler during the past year, especially the aromatic group, phenols, cresols, ethereal oils, camphors and iodin, although his most comprehensive investigations were with m-cresol-anytol and iodin-anytol. In respect to diphtheria and anthrax bacilli and streptococci, anytin alone is as strongly bactericidal as ichthyol and in about the same degree, but does not affect other germs any more than ichthyol, but the meta-cresol-anytol (40 per cent. m-cresol to 60 per cent. anytin) destroys all pathogenic germs with equal effectiveness. It has also the peculiar property of preventing the coagulation of albumin at a boiling temperature by the addition of even 4 per cent. A 1 per cent. solution of m-cresol-anytol has the same bactericidal power as a 3 per cent. carbolic solution, while the 3 per cent. solution is much more powerful, killing all cultures almost totally in less than a minute. Virulent anthrax spores were killed in a 5 per cent. m-cresol-anytol solution in thirty-six hours, which suggests its application to the disinfection of catgut, as it does not injure the catgut to remain in it for forty-eight hours although eight days is destructive. A 1 per cent. solution does not affect the tissues (a 3 per cent. solution is slightly irritating) and is harmless and effective in disinfecting hands and wounds, and has been found more beneficial than any other substance in treating fifty cases of ozena with "most satisfactory results." A 3 per cent. solution was found extremely effective in arresting fresh experimental diphtheritic processes, neutralizing the toxins as well as killing the germs, which recommends it for local applications in diphtheria.—*Deu. Med. Woch.*, March 10.

Protest Against the Gallinger Bill.—To the Hon. Edward Murphy, Jr., United States Senator. *Dear Sir:*—The Academy of Medicine of Syracuse, N. Y., respectfully asks you to give serious attention to *Senate Bill 1063, Calendar No. 136*, a bill purporting to prevent further cruelty to animals in the District of Columbia. The bill is delusive. It is but an entering wedge, having as an ulterior object the prohibition, practically, of vivisection in the District of Columbia, and as an ultimate object the prohibition of vivisection throughout the United States. The passage of the bill is favored by many well meaning but misled people, who have been influenced by persistent misrepresentation and exaggeration on the part of certain persons whose fanaticism is aimed at the foundation of scientific progress in medicine. Only too few investigators are engaged in that practical study of physiology and pathology which demands for its profitable pursuit in interests of suffering humanity, perfect freedom in the matter of vivisection. We protest against the passage of a bill which is a part of a cunning scheme intended, first to hamper, and then to stop the most important investigation scientific medicine has ever attempted. We hold, rather, that the government should liberally encourage in every proper way the continuation of the work, impossible without vivisection, begun by such men as Pasteur in France, Lister in England, Koch in Germany, and Sternberg in the United States. (Signed by the officers and Fellows of the Academy.)

Closing Exercises of the Fourth Session United States Army Medical School.—The closing exercises of the session 1897-98 of the Army Medical School, Washington, D. C., took place in the hall of the library of the Surgeon-General's office at 3 P.M., Friday, April 1, 1898. The walls were handsomely draped with the national colors, which festooned the portraits of former Surgeons-General of the Army and other professional notabilities. Many ladies were present in the audience, which consisted mainly of medical men of the city and the national services. Fewer military men were present than on former occasions of the kind, probably on account of the intensity of the interest just then felt in the strain of our relations with Spain. Colonel Charles H. Alden, Assistant Surgeon-General, president of the faculty of the school, opened the proceedings. In the course of his remarks he said:

"It is hardly necessary for me to tell you anything of the organization and objects of the Army Medical School, as these subjects have been fully made known in the Annual Reports of the Surgeon-General for several years past, and in articles in the medical and general press.

"When the present class leaves the School there will be twenty-four medical officers who have taken the entire course of instruction immediately after their appointment and before going out to their future stations, and about an equal number of assistant surgeons of older date, either on leave or stationed in the vicinity of Washington, have taken partial courses of instruction, chiefly in the laboratories. It will be seen, therefore, that quite a considerable number of assistant surgeons of the Army have felt the influence of the School. The beneficial effects of the course of instruction here held in promoting the efficiency of the medical department and therefore benefiting the Army at large have been noted by many officers of the line, of other departments and by friends of the Army in civil

life; and their appreciation, I am sure, must be very gratifying to the founder of the School, as it is to the corps of instructors.

"The order of daily duties at the School during the present term has been substantially the same as that in former years. The morning hours from 9 A.M. to 12 M. have been passed by the class in the Microscopic Laboratory; the hours from 1 to 3 P.M. in the Laboratory of Sanitary Chemistry, and at 3 o'clock there has been, for five days in the week, a lecture on the 'Duties of Medical Officers,' 'Military Surgery,' 'Military Medicine,' or 'Military Hygiene.' Instruction in hospital corps drill and first aid has been given at Washington barracks at 9 o'clock on Saturday mornings, and later in the morning the Class has been instructed in riding at Fort Myer, Virginia, by Lieutenant Herbert White, 6th Cavalry, through the courtesy of Colonel Sumner the commanding officer. Weekly surgical clinics have been held at the Barnes' Hospital by the Professor of Military Surgery, and instruction in optometry has been given by Captain De Shon, one of the Staff of the School, aided by clinical instruction by Dr. W. N. Suter at the Episcopal Eye Hospital, and also by Dr. L. H. French. Several other auxiliary courses of lectures have been delivered as in former years; one on 'Military Law,' by Lieutenant Colonel Davis, of the Judge Advocate General's Department, Professor of Military Law at West Point, N. Y.; a clinical course on 'Mental Diseases' at the Government Hospital for the Insane, by Dr. George W. Foster through the courtesy of Dr. W. W. Godding, the Superintendent; on the 'Army Medical Library' by Dr. Robert Fletcher, F.R.C.S., and on 'Parasites in Man' by Prof. C. W. Stiles, Ph.D., Department of Agriculture. Two new features of the present course should be noted: one, that the session was extended from March 1 to April 1, to give more time for the completion of the course of instruction; the other, the foundation of the Hoff Memorial Prize Medal. This subject will be explained and the medal awarded by Surgeon-General Sternberg later in the exercises.

"Gentlemen of the Class of 1898: Upon the close of the present exercises you are relieved from further attendance upon the duties of the School, and become subject to the operation of the orders of the War Department assigning you to your future stations. In passing out from this institution you have the warmest wishes of your instructors for your future success and welfare. We feel confident that you will acquit yourselves as officers and gentlemen and efficient surgeons, and that you will do credit to the School, to your Corps, to the Profession and to the Army."

Colonel Alden then introduced Prof. P. S. Conner of Cincinnati, Ohio, who, as a member of the Army Medical Department, had rendered meritorious services during the war of the rebellion, and who has never ceased to maintain his interest in military surgery and in the Medical Department of the Army.

Professor Conner, in his address, reviewed the history of the Medical Corps of the Army from the early times when its members spent their lives on the advance line of our western civilization to the present, when the isolation of the Army surgeon has come to an end, along with the conditions that necessitated the establishment and maintenance of military posts in the wilderness. He reviewed the work of Allison, who as post surgeon of Fort Washington, Ohio, was Cincinnati's first physician. He spoke of the advances made by the early medical officers in our knowledge of the topography, climatology, ethnology, geology, zoology and botany of the country, and reviewed the contributions of the members of the Corps to the literatures of medicine and surgery, mentioning with eulogy many names that are familiar not only in the Army but to the profession at large; and he made honorable mention of many who, like himself, went out into civil life carrying with them those principles of honor and integrity and devotion to duty which are the very life and soul of an Army officer. He congratulated the class on the completion of its academic labors, and testified to his appreciation of the advantages provided for the younger members of the Corps by the establishment of the special courses of the School, which he regarded as one of the best works done by the Surgeon-General of the Army. In concluding he urged the graduates to keep in touch with the general and local profession, taking their places as members of the greater and higher medical Corps which embraces all the good men and true who are advancing medicine and benefiting mankind.

The certificates of attendance were then presented by Surgeon-General Sternberg to the members of the class in the order determined by the results of the examinations held at the close of the term, as follows: 1st, Lieut. Brainard S. Higley, Jr.; 2d, Lieut. Henry Page; 3d, Lieut. Jere B. Clayton; 4th, Lieut. Bailey K. Ashford; 5th, Lieut. Henry A. Webber; and 6th, Lieut. George Rauchfuss.

Dr. Higley is to be congratulated on his success. At the competitive examination held in October last for entrance into the service he was fifth on the list of six accepted candidates; but his earnest work during the session has made him the first recipient of the Hoff Memorial Medal founded recently by Major J. Van R. Hoff, Surgeon United States Army in memory of his father, a surgeon of United States Volunteers during the war, and afterward a member of the regular medical corps, to be awarded annually to the student officer who attains the highest general average at the School.

After some appropriate remarks by the Surgeon-General the members of the class were introduced to Professor Conner, and the exercises ended with an inspection of the museum, library and laboratories.

Louisville.

HEALTH.—The following ordinances, suggested by Health Officer Allen, have been adopted by the Common Council: An ordinance regulating sanitary affairs in manufacturing establishments, lodging houses, boarding houses, etc. The first paragraph of the ordinance is designed to prevent the crowding of persons into one or more rooms; the second paragraph provides that these buildings be adequately provided with ventilation and closets. An ordinance requiring birth certificates to be returned to the health office by accoucheurs, physicians and midwives, with a penalty of from $5 to $20. An ordinance requiring clergymen, magistrates and all having right to perform marriages to report all marriages to the health office. This includes a penalty as the previous one.

Philadelphia.

A PAY HOSPITAL for contagious diseases to be erected in Philadelphia. A company has been formed in the city of Philadelphia for the purpose of building a hospital for the treatment of contagious diseases. The company is now endeavoring to raise $100,000 to be expended for the grounds and building. One new feature of the proposed hospital is that all patients must pay according to their means, and may be attended by their own private physicians. Should success crown the efforts of the incorporators it will necessarily be a boon to those afflicted with any disease of a contagious nature, besides affording the greatest relief and, too often, inconveniences in treating these cases at their homes. The officers are: W. M. Ashman, president; Justus C. Strawbridge, secretary; Clara T. Dercum, treasurer. Among other directors may be mentioned Drs. George M. Gould, J. Madison Taylor, Frederick P. Henry, Edwin E. Graham and Edwin Rosenthal.

MEETING OF THE PENNSYLVANIA HEALTH AUTHORITIES AND THE STATE MEDICAL SOCIETY.—The fifth annual meeting of the Associated Health Authorities of Pennsylvania will be held at Lancaster, Pa., May 18 and 19. At this meeting "Educational Hygiene" will be the principal topic of discussion. By invitation of the State Board of Health, the Associated Health Authorities and the State Medical Society will, on May 20, pay a visit to the Marietta vaccine farms. It is expected that Governor Hastings will be present at the opening ceremonies.

SEPTICEMIA FOLLOWING A CHILD'S BITE.—While doing an intubation upon a child suffering from membranous croup, Dr. Dowling W. Benjamin of Camden, N. J., was unfortunate in having his finger caught by the child's teeth, causing a severe lacerated wound from which septicemia followed. An operation was very promptly done and the wound thoroughly cauterized. At last accounts the Doctor was resting easy.

Detroit.

WAYNE COUNTY MEDICAL SOCIETY.—At the regular meeting of this society, held March 31, Dr. W. Warren read a paper entitled "Tracheitis and Chronic Bronchitis." The Doctor explained how a pharyngeal inflammation can pass downward into the trachea without affecting the vocal chords or the structures immediately adjacent. This, he said, is because of certain histological conditions present in the larynx, viz., that portion of the larynx near the true vocal bands is more dense in structure, the glands are diminutive in size and number, the blood vessels are smaller and less numerous and the mucous membrane is in close apposition with the perichondrial wall; it is for this reason less susceptible to attacks of inflammation than the loose mucous membrane that extends above and below it. The author gave as factors influencing the character and severity of bronchitis, age, city life and humid and severe climates. In discussing the diagnosis, he dwelt particularly on the difference between this disease and pulmonary tuberculosis, the chief points being the presence or absence of Koch's bacillus in the sputum, early or late emaciation the condition of the skin, and the age. The treatment he divided into climatic and medicinal; the latter into general and local. The climate best adapted to these patients is one characterized by mildness, equability and comparative dryness with moderate elevation above the sea level, such regions being found in the mountainous parts of Tennessee, the Carolinas, in the Gulf region and the table lands of the Southwest. In regard to the prophylaxis the Doctor said that persons with any tendency to the bronchial habit should be carefully instructed regarding the matter of clothing and bathing; that treacherous contrivance known as the "chest protector" ought to be discarded and patients should be taught that a well-groomed skin is of more value than any artificial contrivance. By cold sponging and friction of the neck, chest and back one can so temper the skin as to become more or less indifferent to the character of the wind. In the matter of internal medication we must seek to modify the bronchial mucous membrane so as to alter the secretion and combat the congestion; expectoration must be facilitated; the cough must be allayed, and the general health be improved. Among remedies mentioned were the balsamic preparations and liquid extract of hydrastis Canadensis, this last being found of much value given in doses of 20 to 30 drops four times daily. For local treatment the author recommended the intralaryngeal injections of a solution of alumnol and preparations of oleum petrolati with menthol, eucalyptol and essential oils. These are introduced by means of the laryngeal syringe, a sample of which he exhibited to the society. Dr. I. L. Polozker followed with a paper on "The Treatment of Vaginitis in Children." The author stated that in his experience 70 per cent. of the cases of vaginitis in young girls was due to the specific germ of gonorrhea. The essential features of the Doctor's paper were the poor results and disagreeable effects attending the use of such preparations as permanganate of potassium and silver nitrate, and the recommendation to the profession of the employment of a solution (1-500) of formaldehyde locally, containing glycerin to prevent irritation after its use.

HEALTH REPORT for the week ending April 1 is as follows; Total number of cases of diphtheria remaining, 7, 1 death having resulted from the disease: scarlet fever, 15, no deaths; number of births, male, 40; female, 34; deaths, 85; under 5 years 32.

Hospitals.

THE FRAMINGHAM HOSPITAL, by the will of the late Mrs. Caroline McKinstry, South Framingham, Mass., receives $5000. ——A recluse, William J. Headlam, who recently died in Philadelphia of nephritis, and who had lived in great simplicity at the foot of an alley, left his fortune of $50,000 to the Pennsylvania Hospital.——Charlotte Quincy of Beverly, N. J., recently bequeathed $500 to the children's ward of the Pennsylvania Hospital.—The will of the late Amos R. Eno, for many years the owner of the Fifth Avenue Hotel, provides that the Demilt Dispensary and the New York Cancer Hospital shall receive $5000 each. The Society for the Relief of the Ruptured and Crippled and five other charitable organizations receive a like amount.

Colleges.

THE GRADUATING CLASS at the Michigan College of Medicine, Detroit, numbered eighteen.——The nineteenth annual commencement of Central College of Physicians and Surgeons, Indianapolis, was held March 23. There were thirty-five in the graduating class.——From the Medical Department of Iowa State University, March 30, were graduated fifty-four young doctors.——Beaumont Medical College, St. Louis, granted twenty-eight degrees at the annual commencement, March 25.——The graduating class of the Wisconsin College of Physicians and Surgeons, Milwaukee, numbered twenty-two at the annual commencement held March 29.——The fortieth annual commencement of Atlanta (Ga.) Medical College was held March 28, with a class of forty-six graduates.——The Southern Medical College, Atlanta, Ga., held its nineteenth annual commencement March 30, with twenty-eight graduates. ——There were seventy-three graduated from the Louisville Medical College, March 25.——The graduating class of the Medical College of Indiana, Indianapolis, numbered seventy-five.——Vanderbilt University, Nashville, Tenn., awarded the degree of M.D. to sixty-six on March 30.

Societies.

The following meetings are noted:

Illinois.—Chicago Medical Society, April 6; East St. Louis Medical Society, March 21.

Iowa.—Northwestern Iowa Medical Association, Ida Grove, March 22.

Michigan.—Saginaw County Medical Society, Saginaw, March 28.

Minnesota.—Ramsey County Medical Society, St. Paul, March 28.

Missouri.—St. Louis Medical Society of Missouri, April 2.

Ohio.—North Central Ohio Medical Society, Mansfield.

Wisconsin.—Central Wisconsin Medical Society, Madison, March 29.

CHANGE OF ADDRESS.

Arthur, H. M., from Indianapolis to Glen Dale, Ind.
Beaudoux, H. A., from Winona, Minn., to Fargo, N. D.
Campbell, C. E., from Columbus to Grafton, Ohio.
Clement, W. R., from Paducah to Princeton, Ky.
Cohee, W. H., from Indianapolis to Burnsville, Ind.
Engle, H. F., from Iowa City to Newton, Iowa.
Fleemer, O. F., from Indianapolis to Knightstown, Ind.
Hakanson, A., from 7746 Coles Ave. to 153 92d St., Chicago, Ill.
Harvey, D. M., from 911 Laguna St. to 419 3d St., San Francisco, Cal.
Kilgore, F., from Indianapolis to Yorktown, Ind.
Kercher, J., from 104 E. 18th St. to 117 Sedgwick St., Chicago, Ill.
Lawrence, F. F., from 103 N. Fourth St. to 328 E. State St., Columbus, Ohio.
Maxwell, C. L., from Hardy to Forestburg, Texas.
McCall, N. J., from Indianapolis, Ind., to Elkton, Mich.
Petzke, E. A., from Racine, Wis., to Evanston, Ill.
Runkel, A. E., from Milwaukee to Jefferson, Wis.
Roler, A. H., from 2843 to 2330 Indiana Ave., Chicago, Ill.
Thomason, H. D., from Albion, Mich., to Missoula, Mont.
Walker, F. E., from Iowa City to Ladora, Iowa.

LETTERS RECEIVED.

Ashmead, A. J., New York, N. Y.; Arnold, Philip, Elizabeth, Ill.
Bridges, J. R., Kahoka, Mo.; Brennecke, Herman A., Aurora, Ill.; Bowerman, W. G., Cohoctah, Mich.; Brown, Mark A., Cincinnati, Ohio. Cokenower, J. W., Des Moines, Iowa.
Eldridge, E. F., Grand Junction, Colo.; Eby, H. W., Elida, Ohio, Egbert, Seneca, Philadelphia, Pa.
Furay, C. E., South Omaha, Neb.
Graham, J. W., Denver, Colo.
Hay, E. C., Hot Springs, Ark.; Haggard, W. D., Jr., Nashville, Tenn. Kelso, J., Woodland, Pa.
Laplace, Ernest, Philadelphia, Pa.; Lyons, J. B., Charlestown, Mass. McFarland, D. W., Stamford, Conn.
Presbyterian Hospital of the City of Chicago, Chicago, Ill.; Procter & Collier Co., The, Cincinnati, Ohio.
Root, E. H., Chicago, Ill.; Rixford, Emmett, San Francisco, Cal.; Rawlins, John A., Galena, Ill.; Reagin, C. G., Du Quoin, Ill.
Sulter, A. Walter, Herkimer, N. Y.; Saunders, W. B., Philadelphia, Pa.; Smart, Charles, Washington, D. C.
Welch, William H., Baltimore, Md.; Wingate, U. O. B., Milwaukee, Wis.; Waxham, F. E., Denver, Colo.; Welrick, C. A., Chicago, Ill.; Wellner, H., Concord, N. H.

THE PUBLIC SERVICES.

Army Changes. Official List of Changes in the Stations and duties of officers serving in the Medical Department, U. S. Army, from March 26 to April 1, 1898.

Major Charles K. Winne, Surgeon, leave of absence granted on surgeon's certificate of disability is further extended six months on surgeon's certificate of disability.

Navy Changes. Changes in the Medical Corps of the U. S. Navy for the week ending March 26, 1898.

Surgeon L. G. Heneberger, detached from the "Maine" and ordered home to wait orders.

Surgeon S. H. Griffith, detached from the museum of hygiene, Washington, and ordered to the "Mayflower."

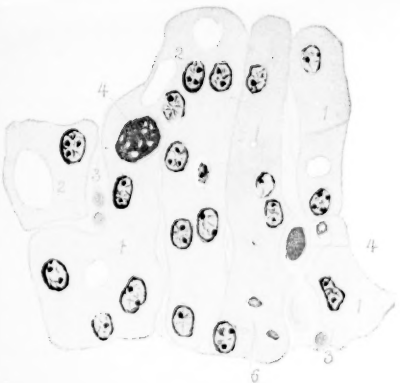

FIGURE 1.—Yellow fever liver amebæ, with commencing destruction of liver-cells, from part of liver with better preserved liver-cells; strong staining with para fuchsin seven parts, methylene blue and green each three parts, discoloration with xylol anilin oil mixtures; 1, liver-cells nearly normal, nuclei mostly divided; 2, liver-cells with vacuoles; 3, leucocytes; 4, amebæ, free and in liver-cells; 6, smallest amebæ, embedded in liver cells.

FIGURE 2.—Yellow fever liver amebæ, in progressed stage of destruction of liver cells; same coloration as in FIGURE 1; 1, liver-cells vacuolated; 2, leucocytes invaded by amebæ; 3, same, much enlarged, protoplasm stained red, nuclear preserved and stained blue; 4, same, with nucleus and vacuoles; 5, amebæ; 6, leucocytes.

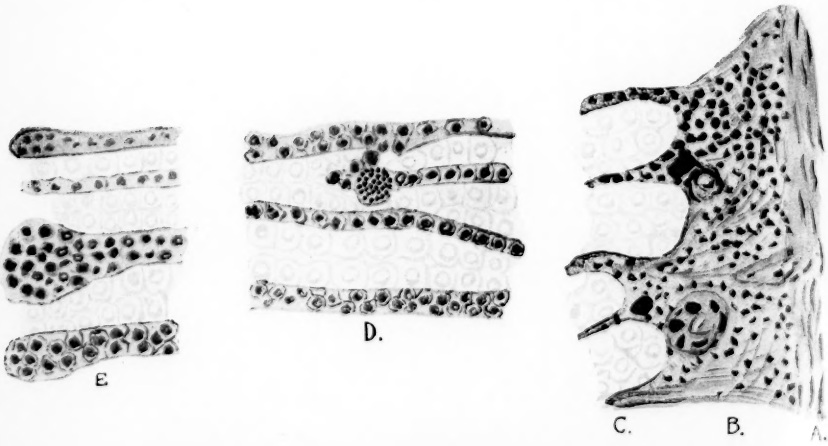

FIGURE 3.—Yellow fever duodenum, amebæ, blackberry body, cell infiltration. A, muscular layer of mucous membrane; B, connective tissue, with arterial vessels; C, deepest part of glands, two oval bodies deeply stained; D, medium part of mucous glands, one blackberry body, sporulating form; E, external part of the glands, fibroblasts in the whole interstitial tissue.

FIGURES 1 and 2, Zeiss ap. 1½, comp. oc. 4; FIGURE 3, Zeiss ap. 4, comp. oc. 6.

ANATOMIC RESEARCHES ON YELLOW FEVER.—EDWIN KLEBS, M.D.